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WAR DEPARTMENT

U.S Dept. of Army

# TECHNICAL MANUAL

# IDENTIFICATION EQUIPMENT PH-385

May 12, 1943

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TECHNICAL MANUAL
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WAR DEPARTMENT,
WASHINGTON, May 12, 1943.

# IDENTIFICATION EQUIPMENT PH–385

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## SECTION I

## GENERAL DESCRIPTION

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1. **Purpose.**—Identification equipment PH–385 is designed for rapid production of personnel identification records in the field by photography and fingerprinting.

2. **Component parts.**—The principal units comprising identification equipment PH–385 are—

Case *A*
Case *B*
Lighting system
Tripod
Camera
Film magazine
Background equipment
Titling equipment
Fingerprinting equipment
Lens
Shutter



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**3. Carrying cases** (figs. 3 and 4).—*a.* The two fiber carrying cases *A* and *B* are 29¾ inches long, 20 inches wide, and 9 inches deep, and are fitted with brass hardware. Each has a carrying handle *A–3* and *B–3*, a trunk lock *A–1* and *B–1* (with key), two clamps *A–2* and *B–2*, three hinges, and brass reinforcements on the corners. Each is identified by stenciling as "case A" or "case B." This information applies to both cases; the differences are given in *b* and *c* below.

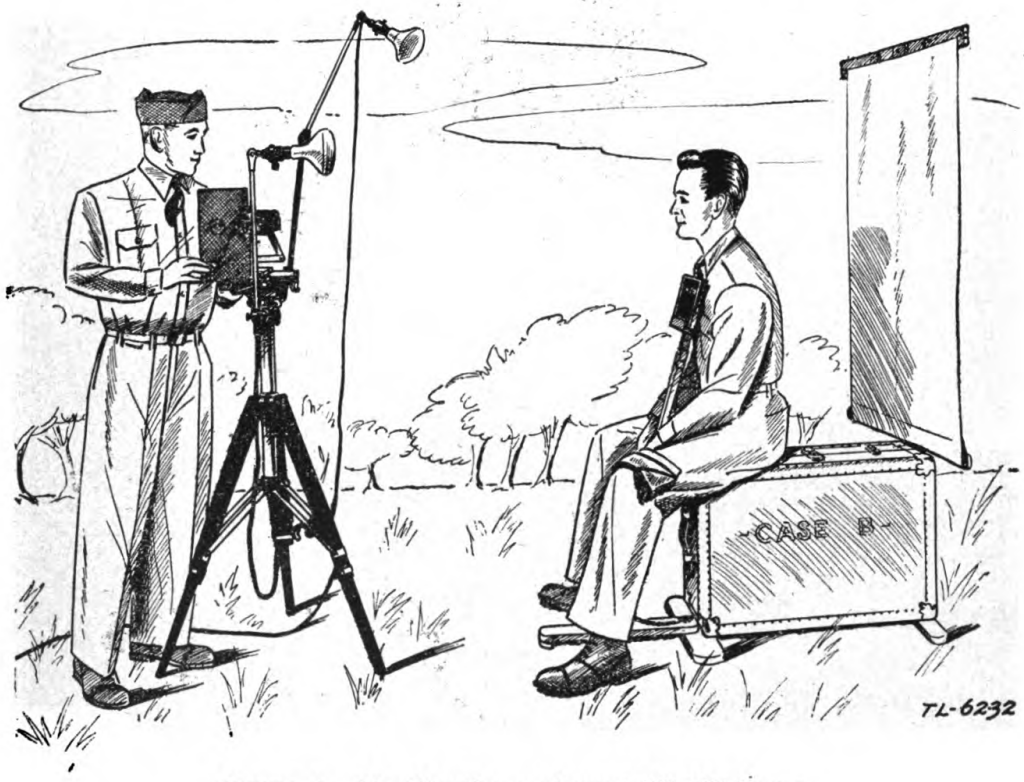


FIGURE 1.—Identification equipment PH–385 in use.

*b.* Case *A* (fig. 3) has one handle, *A–4*, one each end, and houses the lighting equipment *C*, the tripod *D–1*, the tripod top *D–2*, the camera *E*, two film magazines *F*, the fingerprinting equipment *J*, and three 100-foot rolls of spooled 35-mm film.

*c.* Case *B* (fig. 4) has one handle, *B–4*, on the right end and two on the left end. It houses the background equipment *G*, the titling equipment *H*, and two spare lamps *C–5*. When identification equipment PH–385 is in use, the background support is attached to the two handles *B–4–a* and *B–4–b*, while the subject sits on the right end of case. (See fig. 1.)

**4. Lighting system** (fig. 5).—The lighting equipment *C* is a system of tubes and clamps, arranged to support the lamps *C–5–a* and *C–5–b* (300-watt and 150-watt, 120-volt, General Electric R–40 reflector flood lamps). The 300-watt lamp *C–5–a* may be on either



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side, but should always be the higher of the two. The lamp cords *C–4–d* are connected to the supply cord *C–7* by means of the multiple plug *C–6*. (See fig. 2.)

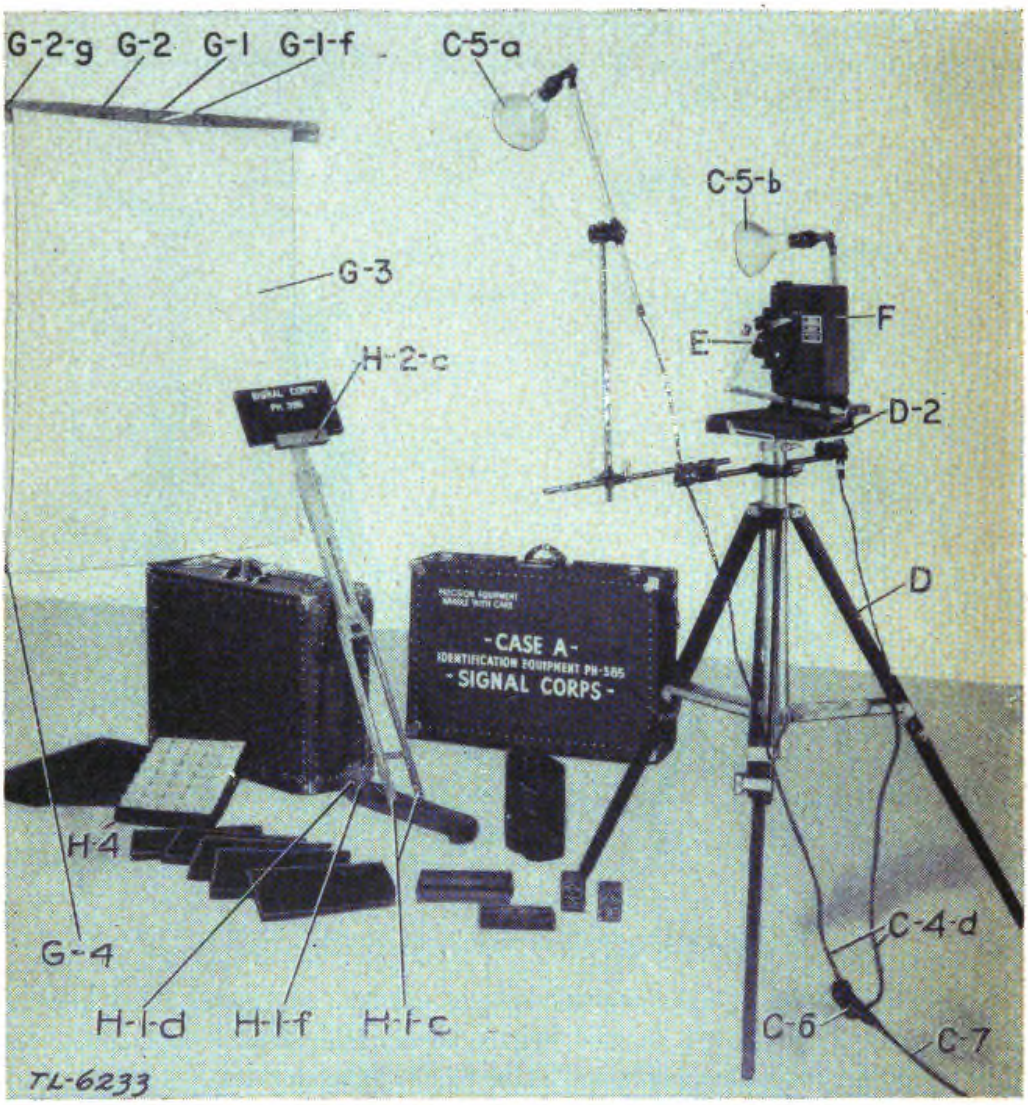


FIGURE 2.—Identification equipment PH–385.

**5. Tripod and tilting top** (fig. 6).—The tripod *D* is a compact stand which has a central column *D–1–e*, three two-section extension legs *D–1–a*, and a leg brace *D–1–f*. Wing screws *D–1–b*, *D–1–d*, and *D–1–h* serve to fix the legs, column, and leg braces in the proper positions. The tripod top *D–2* (fig. 2) consists of a base and a platform hinged at one end and fitted with two tilting arms that lock with a thumb nut *D–2–g* (fig. 5), to fix the platform at any desired angle of tilt. The camera clamp screw in the platform serves to hold the camera pedestal *E–1* (fig. 7).



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**6. Camera** (figs. 7 and 8).—*a. General.*—The camera *E* consists of the pedestal *E–1* which attaches to the tripod top *D–2* by means of the camera clamp screw, and the camera body *E–2* which attaches to the pedestal by means of the camera key screw *E–2–a*. The film magazine *F* attaches to the body by means of the slide lock *E–2–b*

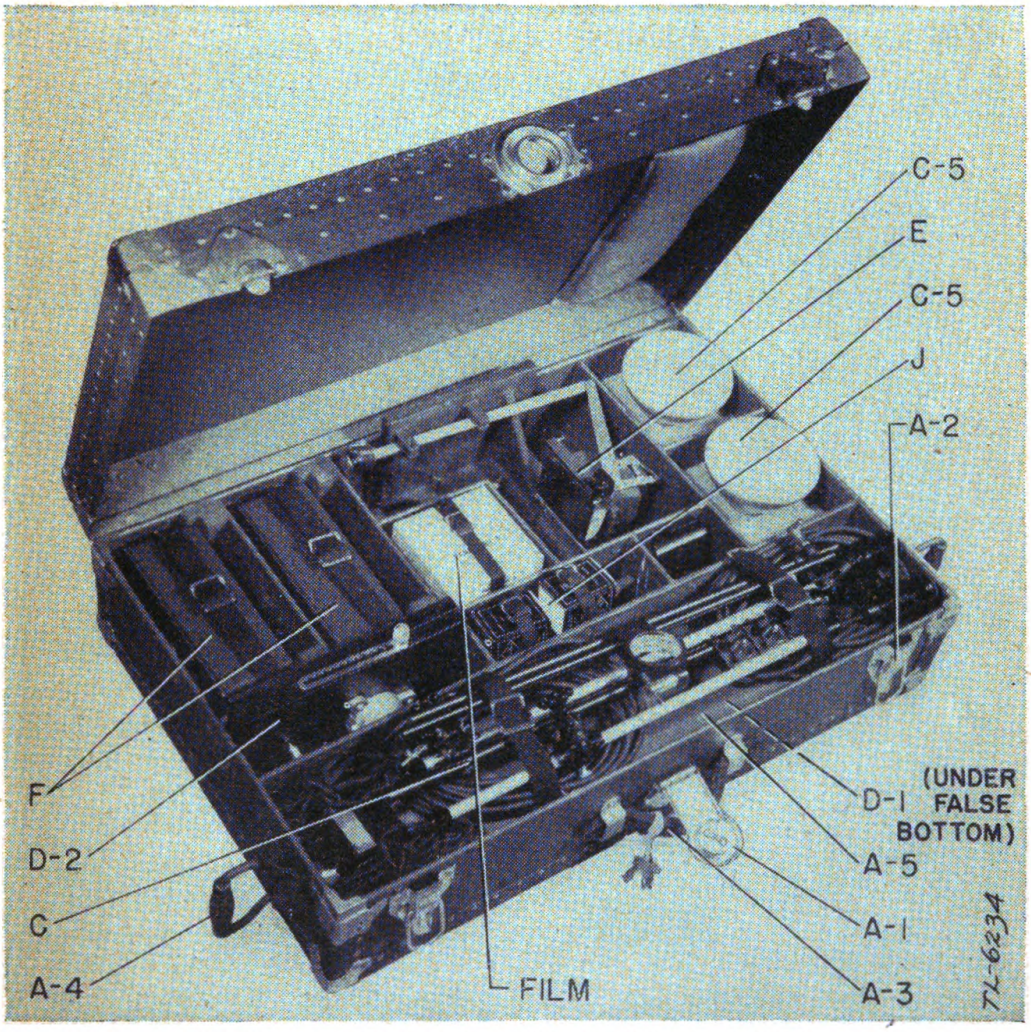


FIGURE 3.—Case A open showing packing arrangement.

and the retaining strip *E–2–c*. The reflecting view finder *E–4* mounted on the left side of the body is used to check the location of the subject as each picture is made. Focusing and framing at the beginning of a job are carried out by means of the ground glass focusing panel *E–5*. Operation of the camera and magazine is accomplished by means of the system of operating levers *E–3*. A complete forward-and-backward movement of the operating arm *E–3–a* causes the shutter to operate and the film to advance. The levers



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are so arranged that an exposure cannot be made accidentally until after the film has been advanced. Eight hundred negatives 25 by 33 mm may be made on 100 feet of film.

*b. Shutter* (fig. 9).—The shutter *S* is a heavy duty Betax No. 2. It is a fully automatic shutter which does not require presetting and is

FIGURE 4.—Case B showing packing arrangement.

operated by one movement of its operating lever *S–2*. The speed scale is marked "2–5–10–20–50–B–T," to indicate exposures of ½, ⅕, 1/10, 1/20, and 1/50 second, and bulb and time. The exposure time is selected by placing the shutter speed lever *S–1* opposite the desired marking on the speed scale.

*c. Lens* (fig. 9).—The lens *L* mounted in the shutter is an 84-mm Photorecord f/5. The diaphragm scale is marked for openings of f/5, 6.3, 8, 11, 16, 22, and 32, and the diaphragm is set by placing the



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diaphragm lever *L–2* opposite the desired marking on the diaphragm scale. The lens may be focused by rotation of the front cell *L–1* after the focusing-lock screw *L–1–a* is loosened. This screw must be tightened after the lens is focused to prevent accidental disturbance of the adjustment.

**7. Film magazine** (figs. 7 and 12).—The magazine *F* consists of a body *F–1* with an internal mechanism to hold and transport the

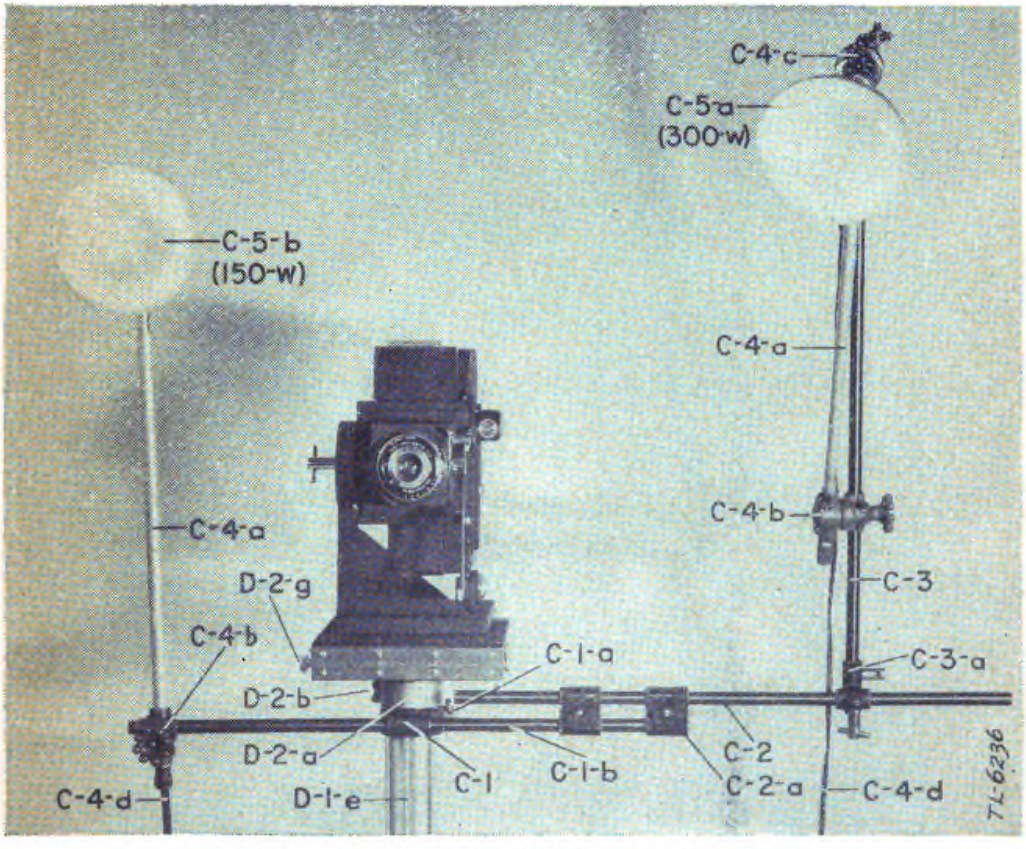


FIGURE 5.—Camera and lighting equipment.

film, and a cover *F–2*. It is fitted with an exposure counter *F–1–a* and a slide *F–1–d*, to prevent fogging of the film when the magazine is detached from the camera. The magazine accommodates 100 feet of 35-mm film on No. 10 Eyemo spools, and is attached to the camera body *E–2* by means of the slide lock *E–2–b* (fig. 8). Movement of the film advance arm *E–3–c* on the return stroke of the operating arm *E–3–a* causes the movement of the operating stud *F–3–a* that transports the film after exposure.

**8. Background equipment** (figs. 2 and 10).—The background equipment *G* consists of a background curtain *G–3*, the wooden background support *G–1*, the cross arm *G–2*, and the curtain weight *G–4*. As shown in figure 10, the three-section support *G–1* is fitted into the



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two handles *B–4–a* and *B–4–b* on the left end of case *B* and secured tightly by the support wedges *G–1–g*. The curtain *G–3* is made of white flannel, 3 by 5 feet, and is hemmed top and bottom. The curtain spring *G–2–g* attached to each end of the cross arm is passed through the upper hem to make the curtain hang flat.

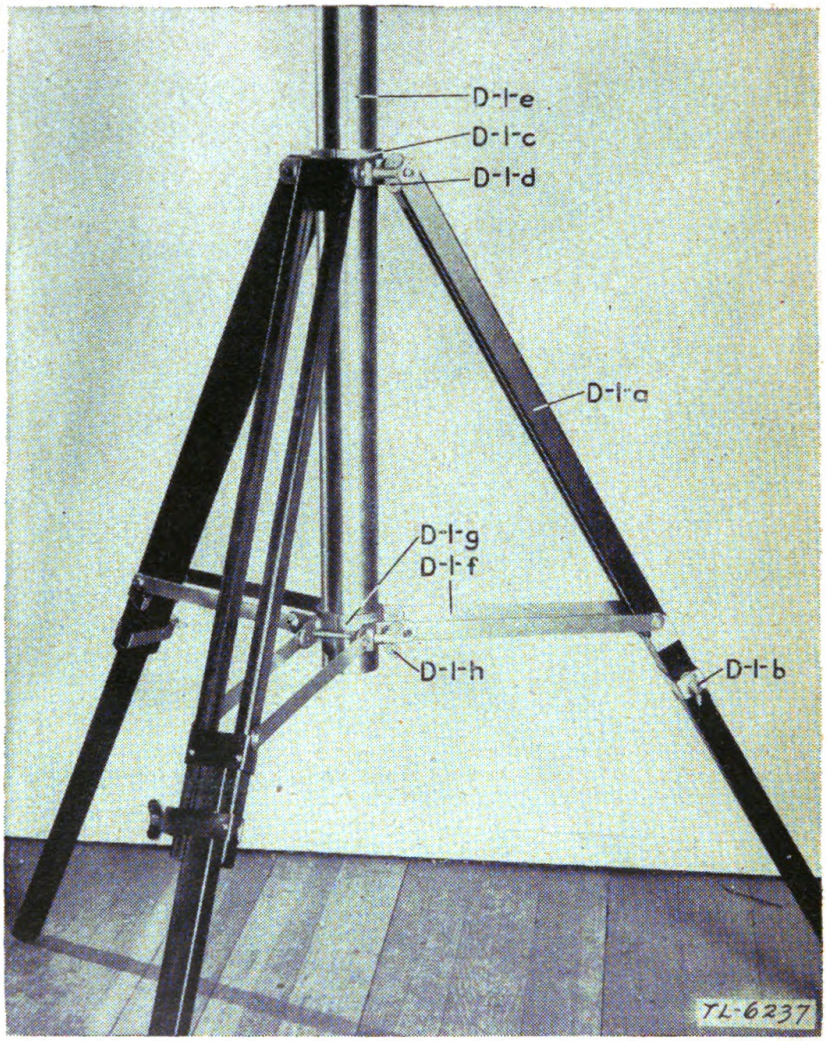


FIGURE 6.—Tripod assembly.

**9. Titling equipment** (figs. 2 and 11).—The titling equipment *H* includes the titleboard holder *H–2*, the base *H–1*, six title boards *H–3*, and six sets of interchangable letters and numbers in three boxes *H–4*.

**10. Fingerprinting equipment** (fig. 13).—*a*. The fingerprinting equipment *J* consists of a card holder *J–1*, an inking slab *J–2*, and two bottles of ink *J–3*.

*b*. The card holder is a wooden block 8 inches long and about 3¾ inches wide, with four drilled holes for which screws are supplied,



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and a hinged metal frame to hold the fingerprint cards in place while impressions are being taken. The card holder is screwed to the edge of a table so that the moulding overhangs and lies tight against its edge.

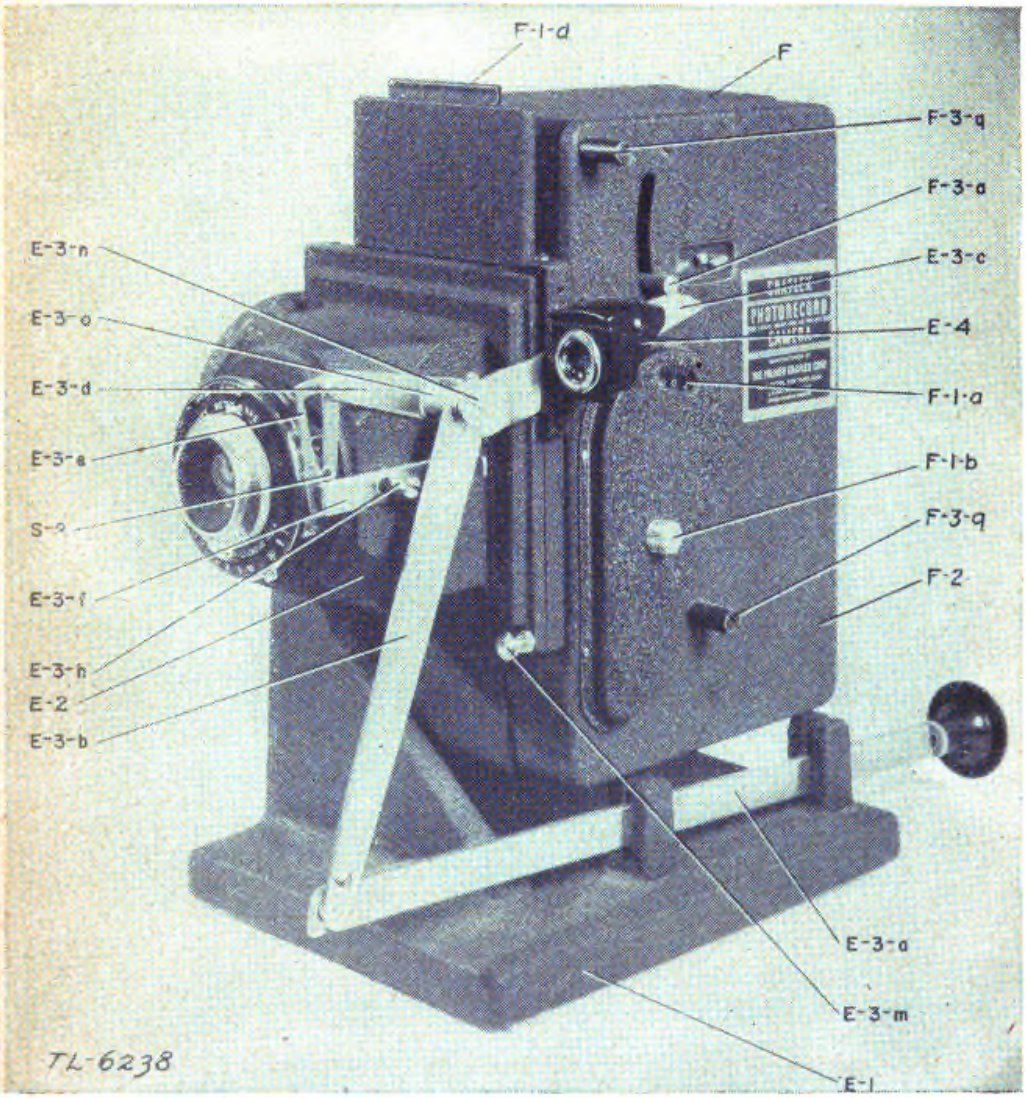


FIGURE 7.—Camera, magazine, lens, and shutter, front view.

*c.* The inking slab is an ink pad consisting of a wooden block covered with a fine-mesh cloth, and is contained in a metal box with a hinged lid.

*d.* The ink is a black ink designed especially for fingerprinting with the inkling slab. A piece of flannel *J–3–a* is in the box with each 1-ounce bottle of ink for use in reinking the slab.

**11. Film.**—*a.* The most suitable film for use with identification equipment PH–385 is a high speed, panchromatic, double perforated,



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35-mm stock (Kodak Super-XX or equal). Film to be used in the magazine must be spooled in 100-foot lengths on No. 10 Eyemo spools, with the emulsion side in. When it is furnished prespooled with an opaque leader and trailer (Eastman type XX–412 or equal), it will be possible to load and unload the magazine in a subdued light without danger of fogging the sensitized film.

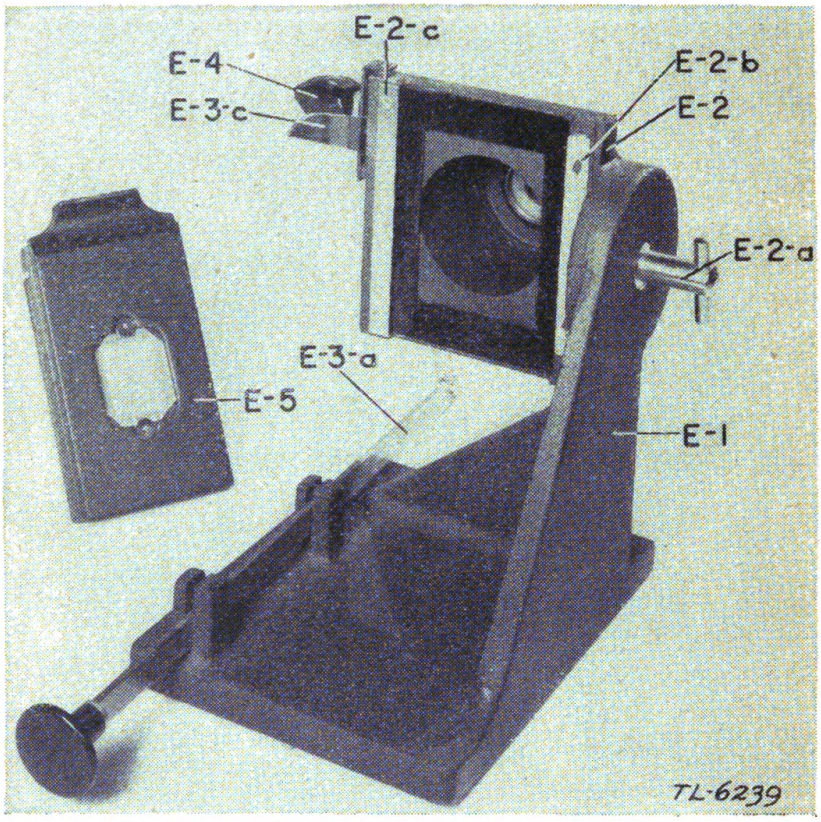


FIGURE 8.—Camera and ground glass, rear view.

***Caution.***—If a partially exposed roll is to be removed, the magazine must be taken to a darkroom for unloading.

*b.* When the film rolls come on No. 10 Eyemo spools, they will probably be contained in individual tins. These tins and the interior wrappings should be preserved for rewrapping and protecting the exposed film. Prespooled film will have about 6 feet of opaque lead film on each end to protect the sensitized film and to permit handling the spool in a subdued light.



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*c.* When film for identification equipment PH–385 is procured in bulk, it must be respooled on No. 10 Eyemo spools in a photographic darkroom, with the emulsion side in. It is important that the film be wound on the spools in such a way that when it unwinds in the magazine, it will turn the supply spool counterclockwise and will feed

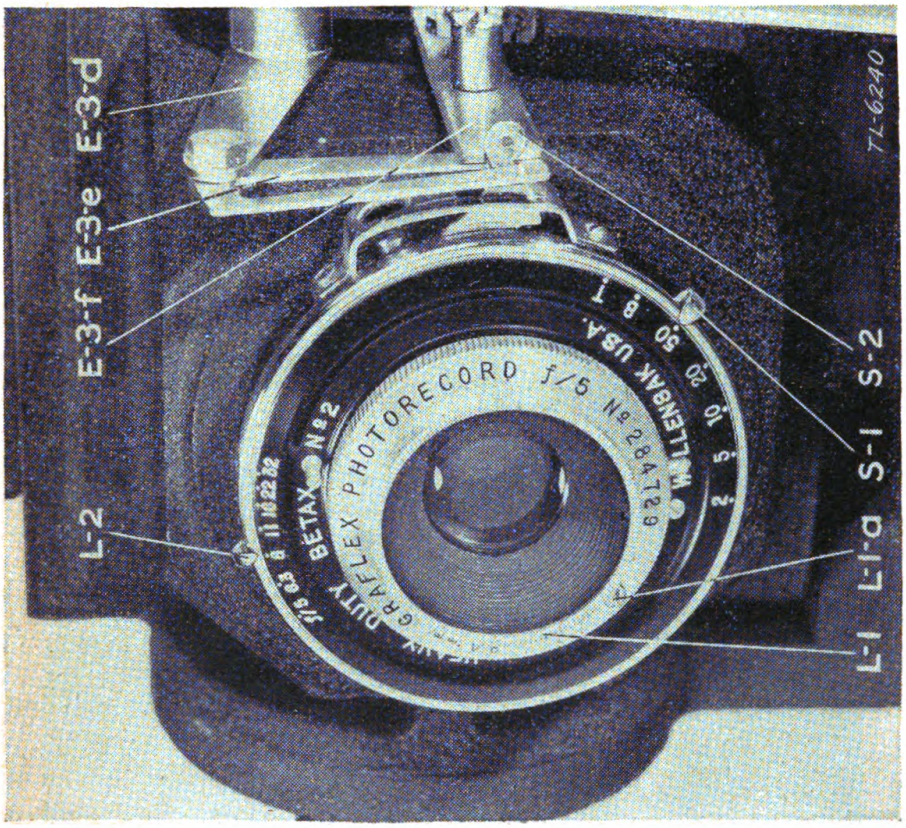


FIGURE 9.—Lens and shutter.

as shown in figure 14. Rolls made up from bulk film will lack the protective leader and trailer attached to prespooled film and therefore the magazine must be loaded in total darkness.

**12. Transportation and packing.**—*a.* Although the two cases containing identification equipment PH–385 can be carried for short distances by one man, it is preferable to transport them by truck. They should be brought as near as possible to the place where they are to be used.



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*b.* The disposition of the equipment in the cases is shown clearly in figures 3 and 4. Each part must be placed carefully in the proper position in its own compartment. All parts are secured by means of

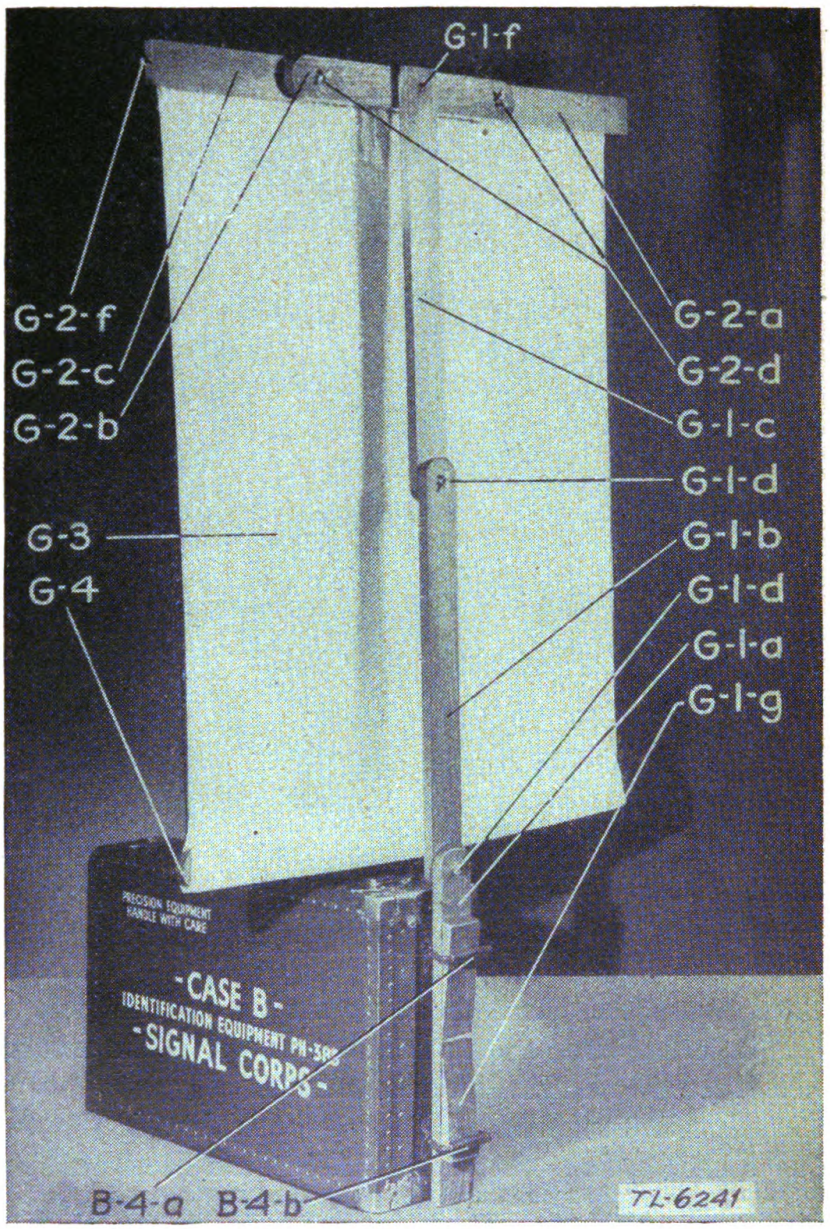


FIGURE 10.—Background equipment.

the keeper straps. If any piece of equipment seems not to fit properly in its compartment, do not try to force it. Find out why it does not go into place and correct the faulty condition.



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*c.* Be sure that both 300-watt or both 150-watt lamps *C–5* are not placed in the same carrying case. Each case should contain one lamp of each wattage.

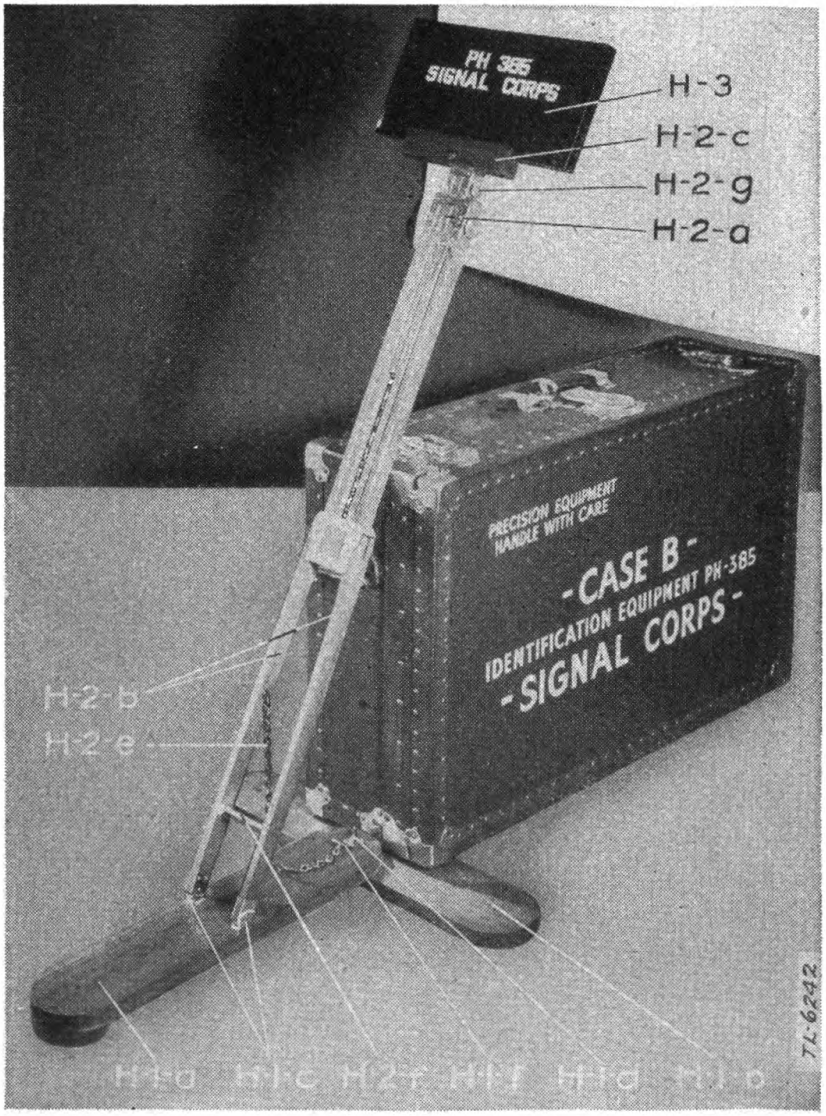


FIGURE 11.—Titling equipment.

**13. Dimensions and weights.**—Following are the approximate dimensions and weights of the cases containing identification equipment PH–385 when packed and ready for transportation:

| *Item* | *Approximate dimensions* | *Approximate Weight* |
|---|---|---|
| Case A---- | 29¾ by 20 by 9 inches---------- | 71 pounds |
| Case B---- | 29¾ by 20 by 9 inches---------- | 46 pounds |



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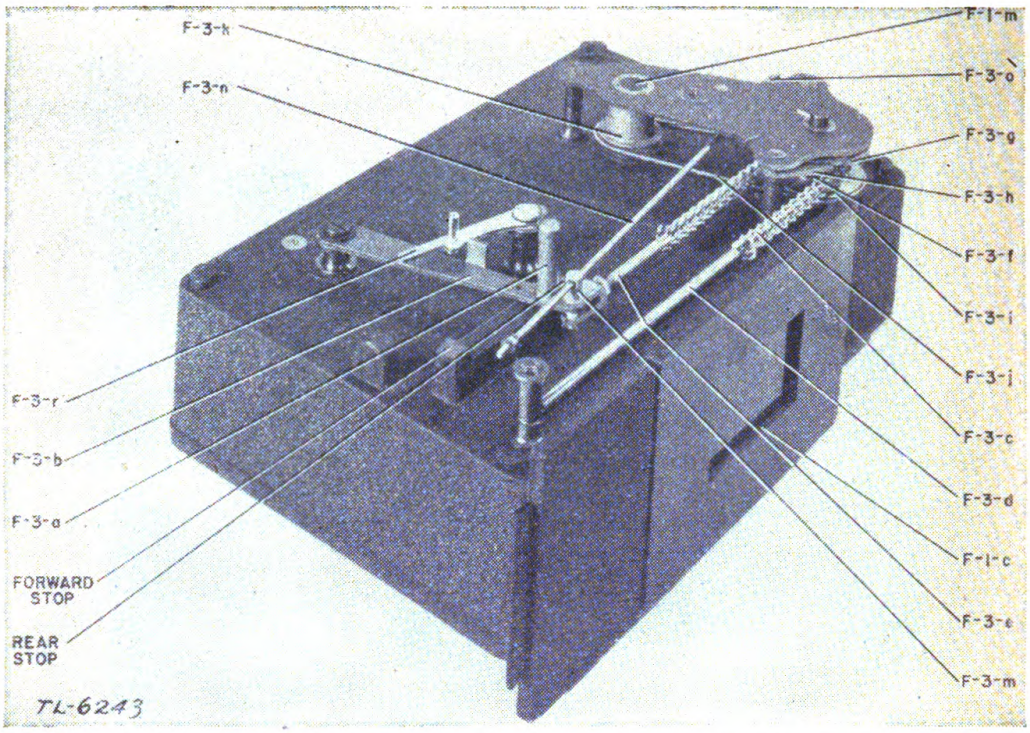


FIGURE 12.—Magazine and operating mechanism, exterior view.

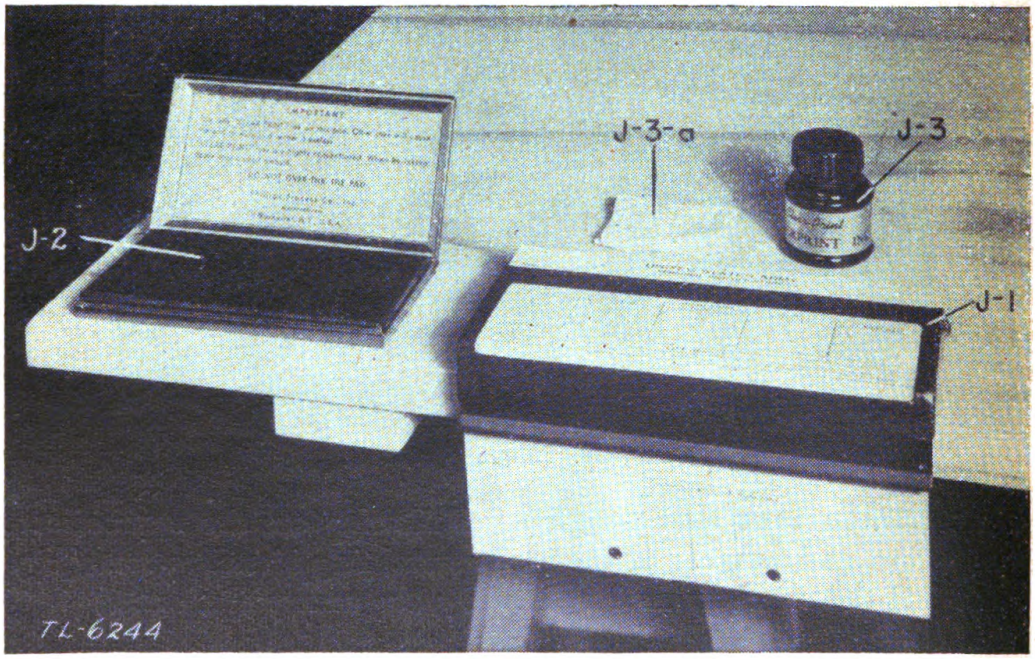


FIGURE 13.—Fingerprinting equipment.



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## SECTION II

# EMPLOYMENT


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**14. General.**—Identification equipment PH–385 is shown set up for use in figure 1. The camera and lighting system are attached to the tripod and the titling equipment and background equipment are supported by case *B*, which also serves as a seat for the subject. The operator stands at the camera and other personnel may be employed to unload and reload magazines, change the letters in the title boards, and take fingerprints.

**15. Unpacking cases.**—*a.* Lay both cases flat on the ground with their covers up. Unlock both cases, open the clamps *A–2* and *B–2*, raise the covers, and loosen all keeper straps.

*b.* From case *A* (fig. 3) remove the lighting equipment, the false bottom *A–5* under it, the tripod *D–1* from under the false bottom, and the tripod head *D–2*. Lay this material in a clean, dry location until it can be assembled. It is advisable to leave the camera, magazines, film, lamps (one 300-watt and one 150-watt), and fingerprinting equipment in the case until the rest of the outfit is set up.

*c.* From case *B* (fig. 4) remove all equipment except the two lamps *C–5–a* and *C–5–b*, one of which should be a 300-watt lamp and the other a 150-watt lamp. Lay the material which has been removed in a clean, dry location until it can be assembled. Close and lock the case and stand it on edge with the handle up, as shown in figure 2.



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**16. Assembling tripod** (fig. 6).—*a.* Loosen the leg-brace wing screw *D–1–h*. Grasp the head of the column with one hand and with the other move the leg-brace ring *D–1–g* to the end of the column and tighten its wing screw *D–1–h*. Then loosen the wing screws *D–1–b* on each of the tripod legs *D–1–a*, draw each lower leg section all the way out, and tighten their wing screws *D–1–b*. Set the tripod down on its legs.

*b.* Place the lighting-support bracket *C–1* on the column about 2 inches above the tops of the legs and tighten its key screw *C–1–a* (see fig. 5). If the column does not project far enough above the leg ring to permit placing the lighting bracket in this position, loosen both wing screws *D–1–d* and *D–1–g* and adjust it properly. Finally, place the tripod top *D–2* on the top of the column and tighten its wing screw *D–2–b*.

*c.* To raise or lower the tripod column, loosen the wing screws on both rings, *but not both at the same time.* First loosen the upper one, raise or lower the column, and tighten the screw. Then loosen the lower wing screw, adjust the leg braces, and tighten the screw. Do not exert unnecessary force on the wing screws.

**17. Assembling lighting equipment** (fig. 5).—*a.* Take the horizontal tube *C–2* and slip its two fixed tube clamps *C–2–a* on either end of the center tube *C–1–b*. Turn it so that it is directly above the center tube and tighten both key screws in the fixed clamps.

*b.* Attach the black vertical tube *C–3* to the horizontal tube *C–2* by means of the adjustable tube clamps *C–3–a*, as shown in figure 5. Tighten the two key screws.

*c.* Then attach the cadmium-plated extension arms *C–4–a* to the free extremities of the center tube *C–1–b* and the vertical tube *C–3* by means of their adjustable clamps *C–4–b*. The clamps are tightened by means of their hand screws.

*d.* Insert the male connectors on the ends of the lamp cords *C–4–d* in the multiple plug *C–6*, and insert this plug in the female socket at the end of the supply cord *C–7*. (See fig. 2.) Screw the lamps into the sockets *C–4–c*, being sure that the 300-watt lamp *C–5–a* is placed in the socket on the *higher* extension (attached to the vertical tube *C–3*), and the 150-watt lamp in the socket on the *lower* extension arm (attached to the center tube *C–1–b*).

**18. Assembling camera** (figs. 7 and 8).—Loosen the thumb nut on the platform of the tilting tripod top, raise the platform to an angle of about 45°, and lock it in that position with the thumb nut. Then attach the camera and pedestal securely to the platform (by means of the camera-clamp screw) in the position shown in figures 2 and 5—that is with the lens pointing toward the hinge of the tripod



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top, and the rear of the pedestal overhanging the rear of the platform. Adjust the tripod so that the lens is level with the eyes of the average subject when seated on the case. Return the platform to the horizontal position. The film magazine is not attached until it has been loaded and the rest of the equipment has been set up and is ready for use.

**19. Assembling background** (fig. 10).—*a.* Close case *B*, clamp and lock the lid, and stand it on edge with the two handles *B–4* facing away from the position to be occupied by the camera.

***Caution:*** The pivoted wooden members of the background and titling equipment are provided with roundhead wooden screws which fit into holes in the parts to which they are pivoted. This helps to maintain the sections in their proper positions. When folding and unfolding these pivoted members, be sure that the wing nuts which hold them are loosened sufficiently so that the heads of the screws will not gouge the wood when the members are pivoted.

*b.* To assemble the background support *G–1*, loosen the two wing nuts *G–1-d* at the joints, unfold the support so the three sections *G–1–a*, *G–1–b*, and *G–1–c* are extended to form a straight line, and tighten the wing nuts. Insert the support *G–1* in the two handles *B–4* of case *B* in such a way that the wing nut on bolt *G–1–f*, in the upper section *G–1–c*, is at the top and faces toward case *B*. Finally, force one wedge *G–1–g down* between the support *G–1* and the upper handle *B–4–a* and the other wedge *up* between the support and the lower handle *B–4–b* to lock the support firmly in an erect position.

*c.* To assemble the cross arm *G–2*, loosen the two wing nuts *G–2–d* at its joints, extend the three sections of the cross arm so that they form a straight line, and tighten the wing nuts securely.

*d.* Remove the wing nut and washer from the bolt *G–1–f* at the top of the support *G–1*, engage the hole in the center section *G–2–b* with the bolt *G–1–f* in the top of the support, and fasten the cross arm securely by means of the washer and wing nut just removed from *G–1–f*. *The two wing nuts G–2–d at the joints of the cross arm should be facing away from case B.*

*e.* Unfold the background curtain *G–3*, slip the spring through the hem of the curtain, attach the ends of the spring to the screw eyes *G–2–f* at the ends of the cross arm, and adjust the curtain so that it hangs smoothly and is centered in relation to the cross arm.

*f.* Unfold the curtain weight *G–4* and slip it through the lower hem of the curtain to hold the curtain flat.

**20. Assembling titling equipment.**—*a.* Set this equipment up at the single-handled end of case *B* facing the position to be occupied by the camera. (See fig. 11.)



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*b.* Loosen the wing nut *H–1–d* at the joint of the two sections of the base and unfold the base in such a way that its front section *H–1–a* is at right angles to the rear section *H–1–b*, and case *B* can rest against *H–1–a* on support *H–1–b*. Be sure that the chain lug *H–1–f* is placed so that its hole lies in the direction of the two ears *H–1–c* and tighten the wing nut *H–1–d*. Slide the base under case *B* as shown in figure 11.

*c.* Unhook the chain *H–2–e* (wrapped around the titleboard holder *H–2* to keep it together) and fold out the two legs *H–2–b*. Place the holder so the crosspiece faces away from case *B*, squeeze the two legs *H–2–b* slightly together, and engage the holes in their lower ends with the inside pins on the ears *H–1–c*. Force up the hinged spreader *H–2–f* until it fits securely against the lug and presses the legs against the ears. Loosen the crosspiece wing nut on the back of the sliding leg *H–2–a*, turn the crosspiece *H–2–c* at right angles to the holder with its rabbetted side up and tighten it securely in that position. Hook the free end of the chain *H–2–e* into the chain lug *H–1–f* at the joint of the two sections of the base. The titleboard holder is now ready for use.

*d.* The assembled titleboard rests in the rabbetted cross arm. Its height is adjusted by loosening the thumbscrew *H–2–g* and moving the sliding leg *H–2–a* up or down as required by the height of the subject. Be sure that the sliding leg is locked in position by means of the thumbscrew after the proper height is attained.

*e. Title boards* (fig. 11).—Each subject is identified by information entered on a title board *H–3* by means of the interchangeable letters and figures packed in the letter boxes *H–4*. As there are six boards, several may be prepared in advance to expedite the process of photographing if sufficient personnel is available for this purpose.

**21. Arranging equipment.**—*a.* Figure 1 shows the relative positions of the various items of equipment when arranged for making head and shoulder photographs.

*b.* The background equipment is attached to the end of case *B* away from the camera, and the screen is at right angles to the length of the case.

*c.* The titling equipment is located at the end of case *B* nearer the camera.

*d.* The camera on its tripod is the same height from the ground as the eyes of the average subject when seated on case *B*.

*e.* The lighting equipment is connected to a 60-cycle, 110-volt power supply.



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*f*. The portion of the equipment not in immediate use is put aside in the most safe and convenient locations.

**22. Loading magazine** (figs. 7 and 14).—*a*. Lay the magazine *F* on a clean, dry surface in a well-shaded place, with the cover knob *F–2–a* up and the picture aperture toward you. Unscrew the knob *F–2–a* and remove the cover *F–2*.

***Caution:*** Unless the cover is lifted evenly, the overlapping light-tight edges may bind slightly. Be sure the slide *F–1–d* is inserted.

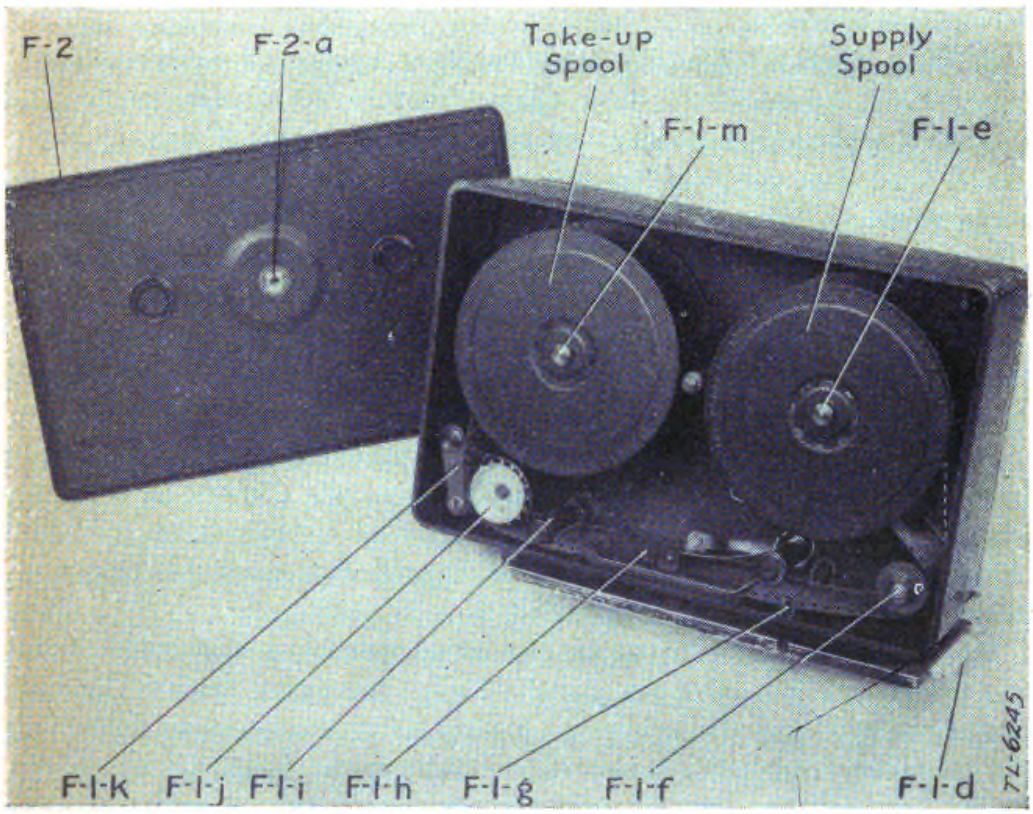


FIGURE 14.—Magazine film chamber.

NOTE.—Information concerning film is given in paragraph 11.

*b*. To load film already spooled with the emulsion side in, place the full spool of film on the supply spool shaft *F–1–e*. Keep the squared opening of the spool *down* so that it fits over the squared section of the shaft (fig. 14). With the spool in place, hold the floating idler *F–1–f* to the left of its normal position so that the brake to which it is attached will be out of the way of the spool. When film wound with the emulsion side out is used, it will follow the path indicated by the dotted line in figure 14.

*c*. Place the film around the floating idler *F–1–f*, back of the guide stud *F–1–g*, under the pressure plate *F–1–h*, under the sta-



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tionary idler *F–1–i*, and between the drive sprocket *F–1–j* and the pressure idler *F–1–k*. *Be sure that the perforations in the film engage the teeth of the sprocket.* Slip the end of the film into the slot of the take-up spool and place the spool on the take-up spool shaft *F–1–m*, permitting the squared opening in its lower flange to engage the squared section of the shaft. Turn the take-up spool clockwise until the film is taut. Check to be sure that the film is not looped over the brake at the top of the supply spool but moves freely between the two spools. Then replace the cover *F–2* and tighten the cover knob securely.

*d.* If a daylight loading spool with a leader of opaque film is being used, advance the film approximately 40 double frames by means of repeated movement of the operating stud *F–3–a* (fig. 7). To be sure that the film has advanced sufficiently before starting to make pictures, remove the draw slide *F–1–d*, and if the sensitized film (cream colored) is not already visible, advance the mechanism until it does appear. The leader is nearly white in color. Replace the draw slide *F–1–d*, advance the film two more frames, and turn the exposure counter dial *F–1–a* to zero by means of the counter setting knob *F–1–b* on the front of the magazine.

*e.* Be sure that the slide *F–1–d* is not removed after the magazine is properly loaded unless the magazine is in the camera or a photographic darkroom. If the slide is removed in the light, the film behind the picture aperture will be fogged and must be advanced two frames to place the unexposed film in position.

**23. Preliminary arrangement of camera.**—*a. General.*—After the equipment has been set up, the lights connected with a 110-volt power supply, and the magazine loaded, it is necessary to determine the distance from the camera to the subject, to focus, to adjust the lights properly for even illumination, to attach the magazine, and to determine the exposure and set the lens and shutter.

*b. Distance and focus.*—The distance from the camera to the subject determines the size of the image recorded on the negative; the shorter this distance, the larger will be the image. At about 48 inches from the focal plane (the place where the image is formed and the film lies), the negative will include the head and shoulders of the subject and the title board. To make possible sharp images at the various distances at which photographs may be made, the lens is focused as directed in *c* and *d* below.

*c. Attaching focusing panel.*—The following steps are necessary in attaching the ground glass focusing panel *E–5* (fig. 8):

(1) Open the slide lock *E–2–b* by pushing upward on the lug at its upper end.



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(2) Insert the focusing panel (handle up) with its left edge under the retaining strip *E–2–c* and push it forward until it seats.

(3) Close the slide lock by pushing down on its lug.

*d. Focusing lens.*—Focus the lens as follows (figs. 8 and 9):

(1) Move the operating arm *E–3–a* fully forward, fully back, and then halfway forward.

(2) Set the shutter speed lever *S–1* at "T" (time).

(3) Move the operating arm *E–3–a* fully forward and then fully back; this will open the shutter and hold it open until it is closed by a second push-pull movement of the operating arm.

(4) Set the diaphragm at its full opening by moving the diaphragm lever *L–2* to f/5.

(5) Loosen the focusing lock screw *L–1–a* about one turn counterclockwise or until the front cell *L–1* is freed sufficiently to rotate without binding.

(6) Seat the subject on the near end of case *B* facing the camera, with the titleboard resting on his chest.

(7) Place some letters on the titleboard to serve as targets for focusing.

(8) Switch on both lamps and direct them so that the head and titleboard are illuminated evenly. Loosen the adjustable clamps at both ends of the extension arms *C–4–a* if necessary.

(9) Place a focusing cloth, coat, or some other opaque cloth over your head and the camera to shield the focusing panel from direct light. Then reach around to the lens with your right hand.

(10) Keeping your hand below the lens, grasp the front cell of the lens with the right thumb and forefinger. Rotate it slowly in one direction or the other, until the image of the letters and face is formed sharply on the ground glass.

NOTE.—The image will remain apparently sharp throughout a short range of rotation because of the "depth of field" of the lens. Set the lens at the midpoint of this range and consider it as the proper adjustment for sharpest focus.

(11) Tighten the focusing lock screw *L–1–a*, taking care not to rotate the front cell *L–1* and disturb the focus.

(12) Rotate the front cell counterclockwise (as viewed from the front) moving it out to focus on nearer objects. Rotate the cell clockwise, moving it into focus on more distant objects.

**24. Other adjustments of camera.**—*a.* If the camera is not placed at the proper distance to give the desired size of image, move it toward or away from the subject until the image is of the proper size. While doing this, observe the image on the ground glass and refocus, as explained above.



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*b.* Always be sure that the focusing lock screw *L–1–a* is tightened after the proper image size and focus have been secured, to prevent accidental disturbance of the adjustment.

*c.* After securing the proper distance and focus, close the shutter by a forward and backward movement of the operating arm *E–3–a*. Reset the shutter speed lever to the speed indicated before you change it to "T."

**25. Attaching magazine.**—*a.* When the magazine *F* has been loaded as directed in paragraph 22, attach it to the camera as follows:

(1) If the ground glass focusing panel is in place, remove it after opening the slide lock *E–2–b*.

(2) Take the magazine in the right hand with the picture aperture *F–1–c* toward the camera and the draw slide handle up.

(3) Be sure that the slide lock *E–2–b* is open, and place the magazine in the camera with its lip under the retaining strip *E–2–c*.

(4) Secure the magazine to the camera by closing the slide lock *E–2–b*.

(5) Check to be sure that the film advance lever *E–3–c* lies under the operating stud *F–3–a* as shown in figure 7.

(6) Test the camera by one or two push-pull cycles of the operating arm *E–3–a* without removing the slide *F–1–d*, to be sure that everything is in order.

*b.* When the magazine has been attached to the camera in this way, the camera is loaded and ready for use.

**26. Determining correct exposure.**—*a. General.*—Exposure is defined as a combination of exposure time (shutter speed) and exposure intensity (diaphragm opening). *Correct* exposure is the exact combination of these two variables that allows the film to be acted upon by the proper amount of light to assure a good negative when the exposed film is correctly processed in the recommended developing solution. The approximate exposure may be determined in several ways, but remember that values derived from rule-of-thumb calculations, or even from measuring instruments, must always be modified by experience and by the particular conditions prevailing at the time of the exposure. It is recommended that, whenever possible, you expose and process a test strip at the beginning of any large job. Do this under the exact conditions of exposure and development expected during the exposure and processing of the final negatives.

*b. Exposure meter.*—Use a photoelectric exposure meter, if available, to determine the approximate exposure. This does not eliminate the desirability of exposing and developing a test strip if there is sufficient time.



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*c. Approximate values.*—If no exposure meter is available, you may use as a basis for determining the exact exposure an approximate value obtained by means of test strips, as explained below:

(1) With artificial light only (that is with no light except that from the lamps of identification equipment PH–385 falling on the subject), the average basic exposure on a film such as Super-XX Pan (tungsten speed of 64 Weston or 100 General Electric) should be in the neighborhood of $\frac{1}{50}$ second at f/8.

(2) By daylight, in the "open shade" on an average clear summer day between 0900 and 1500 (with a blue sky and the sun not obscured by clouds), the approximate exposure on a film such as Super-XX Pan (daylight speed of 100 Weston or 125 General Electric) should be in the neighborhood of $\frac{1}{100}$ second at f/16. This holds true regardless of the distance of the subject from the camera.

*d. Setting shutter speed and diaphragm* (fig. 9).—When the settings to be used have been determined, set the shutter speed by moving the shutter speed lever *S–1* to the marking for the desired speed, for example, "20" for $\frac{1}{20}$ second. Set the diaphragm opening likewise by moving the diaphragm lever *L–2* to the marking for the desired aperture, for example, "16" for f/16.

*e. Test strips.*—(1) When the shutter and diaphragm have been set for the basic exposure, remove the slide *F–1–d*. Then make a series of exposures at this setting and at other settings, giving both greater and less exposures. Keep a complete record of all data so that results can be duplicated under similar conditions at any time. These data should include the condition of the sky and shade for daylight pictures, the position and distance of lights when used, the exposure meter reading for daylight or artificial light, the shutter speed and diaphragm opening employed, and the developer, its temperature, and the duration of development.

(2) For example, if a basic exposure of $\frac{1}{20}$ second at f/8 is selected, make three or four exposures at this setting by moving the operating arm *E–3–a* forward and back through three or four cycles. Then set the lens and shutter to give twice the exposure (by opening up the lens one stop to f/5, or by slowing down the shutter to $\frac{1}{10}$ second) and make three or four more exposures. Following this, use one-half the exposure for three or four more frames (by closing down the lens one stop smaller than the basic value to f/11, or by speeding up the shutter to $\frac{1}{50}$ second). It may be advisable to give additional test exposures of four times and one-fourth the basic exposure, making the adjustments with the shutter speed or lens aperture, in a manner similar to that explained above.



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(3) Remove the magazine, take it to a photographic darkroom, open it, and remove the section of the film containing the test exposures. The film is then ready for development, which must be done in the same way and under the same conditions as the regular negatives. After the negatives have been examined, select the optimum setting and use it for the job in progress.

**27. Making actual exposures.**—*a.* As stated above, the shutter is operated and the film advanced by a push-pull movement of the operating arm. It is essential that this movement be steady, deliberate, and gentle. Slamming the operating arm will jar the camera and cause vibration that blurs the negatives. *Be sure to remove the slide F–1–d before making exposures.*

*b.* At the beginning of a job, examine the exposure counter *F–1–a* to determine how many exposures can be made on the film remaining in the camera. Examine it from time to time thereafter so that you will not operate the camera after the sensitized film has all passed the picture aperture.

*c.* Place the letters and figures on the titleboard and place it on the crosspiece *H–2–c* of the titleboard holder *H–2*. Seat the subject on the end of case *B* facing the camera and lean the titleboard holder against his chest so that the top of the titleboard is about 6 inches below his chin. The titleboard may be raised or lowered by loosening the sliding leg thumbscrew *H–2–g* and moving the sliding leg *H–2–a* (fig. 11) as necessary.

*d.* Glance in the view finder *E–4* to be sure that the subject will be centered in the picture, and operate the main operating arm *E–3–a* to expose the film. If the subject is not properly centered, raise, lower, or rotate the camera as necessary before exposing the film.

*e.* Repeat *c* and *d* above for subsequent subjects, checking the exposure counter *F–1–a* occasionally so as not to operate the camera after the sensitized film has all passed the picture aperature.

*f.* Replace the slide *F–1–d* when the counter reads "800," and remove the magazine from the camera. Manually rotate the operating stud *F–3–a* 40 to 50 times to roll up the opaque trailer on the take-up spool. Place a full magazine on the camera and continue on the job as before.

*g.* You may want to expose a pilot strip (12 to 15 exposures of your last subject) at the end of the film in order to develop a sample piece of film before developing the roll. This will allow you to adjust the developing time, if necessary, before developing the whole roll.



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*h.* You may use the following expedient when it is desirable to develop the film in short pieces of about 30 exposures each or less.

(1) Run off the leader on a new roll.

(2) Check for sensitized film at aperture as a paragraph 22*d*.

(3) Attach a small piece of scotch tape to the film in the aperture and replace slide *F–1–d*.

(4) Advance film two frames by moving operating stud *F–3–a* twice.

(5) Place magazine on camera, remove slide *F–1–d*, and take 30 pictures.

(6) Replace slide *F–1–d* and remove magazine from camera.

(7) Advance film two frames (with operating stud *F–3–a*).

(8) Remove slide *F–1–d*.

(9) Repeat steps (3) to (8), inclusive, every 30 frames. The film may be cut (at the marked spots) into short lengths for small tank developing. You may use the same method for marking the test strip (par. 26*e*) or pilot strip (*g* above).

**28. Unloading magazine.**—*a.* The magazine may be unloaded in subdued light if daylight loading spools with opaque leader and trailer are being used. If spooled bulk film is in the magazine, open it only in a photographic darkroom. When unloading the magazine in the light, replace the spool immediately in the foil wrapping and tin in which it was supplied. When unloading in a darkroom wrap and place the spool in its tin if it is not to be processed immediately.

*b.* The steps involved in unloading the magazine are as follows:

(1) Lay the magazine on a clean surface with its cover knob *F–2–a* up and the picture aperture *F–1–c* toward the operator.

(2) Unscrew the cover knob and lift the cover *F–2* straight up and off.

(3) Lift the take-up spool straight up and off its shaft *F–1–m*.

(4) Pack or process the film as instructed previously.

(5) Reload as directed in paragraph 22, or replace the cover.

**29. Summary of operating procedure.**—*a.* The main steps involved in operating the camera of identification equipment PH–385 are as follows:

(1) Set up the equipment.

(2) Load both magazines in a darkroom. Insert slides *F–1–d* and check the exposure counters *F–1–a*.

(3) Attach one magazine to the camera.

(4) Estimate the approximate exposure.

(5) Set the diaphragm and shutter.

(6) Remove the slide *F–1–d*.



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(7) Enter information on a titleboard, seat the subject on case *B*, place the titleboard in the titleboard holder, and lay it against the subject's chest.

(8) Expose and develop a test strip (*optional*). Adjust the diaphragm and shutter settings if necessary in accordance with appearance of the test strip (*optional*).

(9) Check the exposure counter.

(10) Check position of the subject through the view finder.

(11) Expose with a steady, gentle, push-pull movement of the operating arm *E–3–a*.

(12) Change the titleboard and subject.

(13) Check the position of the subject through the view finder.

(14) Check the exposure counter from time to time.

(15) at "800" on the exposure counter, stop photographing.

(16) Just before reaching "800" on the counter, make 12 exposures of the last subject if you wish, for use as a pilot strip in processing, marking it as in paragraph 27*g* (*optional*).

(17) Replace the slide *F–1–d*.

(18) Remove the used magazine.

(19) Attach the new magazine loaded with unexposed film.

(20) Develop the pilot strip (*optional*). Adjust the developing time if necessary in accordance with appearance of pilot strip.

(21) Develop the roll of exposed film.

*b*. It must be emphasized that the preceding summary of the operating procedure is only an approximation of the usual method. In actual practice, modifications and deviations may be necessary. You must constantly be on the alert to adapt your methods to unusual conditions.

NOTE.—The processing of exposed film will be carried out in accordance with instructions in TM 1–219

**30. Fingerprinting.**—*a. Equipment.*—Use an inking pad, fingerprinting cards, and a card holder in taking fingerprints.

*b. Types of impressions.*—There are two types of impressions, rolled and plain or fixed impressions. The rolled impressions give individual prints of each digit (thumb or finger) from edge to edge of the nail and to just below the first joint. The plain or fixed impressions give prints of all four fingers of each hand as a group, plus the thumbs separately. They include the surface of each digit from near the tips to below the middle joint. The plain impressions serve as a check that the rolled impressions were taken in the correct order and give added assurance of proper classification in case the rolled impressions are not clear.



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*c. Technique.*—With practice, you will learn to make clear fingerprints. The technique requires care in use of the equipment and in the manual operations involved.

*d. Precautions.*—Certain general precautions should be taken to assure clear, readable prints:

(1) The inking slab must be clean.

(2) The digits should be scrubbed with soap and water if dirty or calloused. If the subject has a tendency to perspire, swabbing with alcohol, benzine, or a similar solvent after washing will help further to insure good prints.

(3) The subject must be relaxed. If the ink slab and card are at the recommended height (42 to 44 inches above the ground), his forearms will be about horizontal. The subject should not look at his hands during the operation, and should permit you to move and press his fingers without help or resistance. If the subject is stiff, tell him to relax.

(4) The pressure which you apply is extremely important. It must be even and firm enough to pick up and transfer sufficient ink, yet not heavy enough to force ink into the furrows between the ridges when inking, to flatten the ridges when printing, or to cause the fingers to slip on the ink slab or card.

(5) The special precautions given in paragraph 31 for rolled and plain impressions must also be observed.

(6) Although fingerprinting ink dries quickly you must be careful when handling the cards, particularly in humid atmospheres, in order not to smudge the prints.

**31. Taking fingerprints.**—*a. Preparing equipment.*—First attach the card holder about 1 foot from the left end of a table or other support which is about 42 to 44 inches above the ground. Four wood screws for this purpose are attached to the under side of the holder with adhesive tape. It may be necessary to set a table on a box or similar object to attain the 42- to 44-inch height which will bring the subject's arms and hands to a relaxed position, enabling you to do a better job. Place the inking slab just to the left of the subject while inking and printing.

*b. Inserting card in holder.*—Enter the required data on the card. Lift the frame of the card holder and insert the card so that the spaces marked for the right hand will lie on the flat portion of the holder and in the opening of the frame when it is closed. Then close the frame, snapping it securely.

*c. Placing subject.*—Have your subject stand in front of the card holder in a comfortable position. Tell him to relax and not to look at his hands while you are working with them.



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*d. Rolled impressions.*—(1) *Inking.*—Take your subject's right thumb in your right hand and have him curl his fingers comfortably in the palm of his hand. Place his thumb on the inking slab so that you can ink it from edge to edge of nail and to just below the first joint. Apply a firm, even pressure on the subject's thumb with the index finger of your left hand. Roll the thumb away from the center of the subject's body (away from you for his right hand) to ink the thumb with *one* rolling movement. Too much pressure will pick up too much ink; too little pressure will not pick up enough.

(2) *Printing.*—Lift the subject's thumb from the inking slab and move it over above the place marked on the card for the right thumb. Use the same rolling movement that you used in inking to make the print on the card with *one* rolling movement. Repeat inking and printing for the first, second, third, and fourth fingers of the right hand in order.

(3) *Left hand.*—Move the card in the holder to place the left hand spaces in position. Roll the subject's digit away from the center of his body (toward you for his left hand) while inking and printing. Ink and print the left thumb, first, second, third, and fourth fingers in order, using the technique prescribed for the right hand *with the exception of the direction of rolling.*

*e. Plain impressions.*—(1) *Placing card.*—Move the card in the holder to place the right hand plain impression space in the frame opening and close the frame.

(2) *Inking.*—Take your subject's right wrist in your right hand (firmly but gently) and have him curl his thumb under his palm out of the way. Lay the subject's fingers (all together) on the inking slab and press them down firmly and evenly with the fingers of your left hand. Ink them to below the middle joint of the index finger.

(3) *Printing.*—Lift his fingers from the inking slab, place them carefully on the card, and press with the fingers of your left hand to make the print.

(4) *Left hand.*—Repeat (2) and (3) above for the fingers of the subject's left hand.

(5) *Thumbs.*—Ink and print the right and left thumbs successively, using the procedure used with the fingers. *Do not roll the thumbs when making these prints.*

*f. Missing digits.*—If any digit is missing, write in the space provided for that finger or thumb, "amputated at _____ joint," stating at which joint it was cut off.

*g. Reinking slab.*—Follow these instructions when it is necessary to reink the slab: Fold the flannel cloth to four thicknesses, wet it with



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ink, and work the ink into the slab with circular motions of the cloth to cover the entire surface.

**32. Dismounting and packing identification equipment PH–385.**—On the completion of a job, the equipment should be promptly cleaned, disassembled, and packed into its two cases.

*a.* Wipe or blow all dust and dirt from the equipment. Special instructions for cleaning the lens must be observed. In cleaning a lens, remember that optical glass is necessarily soft and can be damaged seriously by careless cleaning. First blow off or lightly dust the front element with a clean cloth to remove particles clinging to it; then wipe it *lightly* with lens tissue or a very clean, soft piece of cotton or linen cloth. A well-laundered, old, clean handkerchief is excellent for this purpose. *Never use a hard cloth like silk, nor any dirty or oily cloth.* If further cleaning is needed, moisten the glass with your breath and wipe it lightly with a fresh portion of the cloth. *Never use water, alcohol, or any ordinary cleaning fluid on a lens.*

*b.* Replace immediately any screws, bolts, nuts, or washers removed during disassembly so they will not be lost.

*c.* Pack the equipment in its carrying cases *A* and *B* as shown in figures 3 and 4. Be sure to secure all equipment with the keeper straps. The background and titling supports are most conveniently stowed in their compartment in case *B* as follows: Place the wedges *G–1–g* at each end of the bottom of the compartment, and then the folded curtain weight *G–4* in the center. Fold up all three sections of the background support *G–1*, and the long section of the cross arm *G–2*, and place these two members on edge on top of the curtain weight and wedges. Fold up the titleboard holder base *H–1* and place it flat on the support *G–1* and cross arm *G–2*. Fold back the legs of the titleboard holder *H–2* and secure them with the chain. Place the crosspiece *H–2–c* lengthways with the holder *H–2* and lay the holder on top of the base with the crosspiece down.

NOTE.—See paragraph 12 for further information on packing.

*d.* Put fingerprinting equipment in its place in case *A*.

## SECTION III

## FUNCTIONING OF EQUIPMENT


| | Paragraph |
|---|---|
| General | 33 |
| Main operating system | 34 |
| Shutter operating system | 35 |
| Magazine operating system | 36 |


**33. General.**—The principles of operation of all the parts of identification equipment PH–385 are self-evident with the possible excep-



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tion of the camera *E* and the magazine *F*. Three mechanisms are involved in the functioning of the camera and magazine: the main operating system, the shutter operating system, and the magazine operating system.

**34. Main operating system** (figs. 7 and 15).—This system consists of the main operating arm *E–3–a* and the main operating lever *E–3–b*. Movements of the main arm *E–3–a* are transmitted by the main operating lever *E–3–b* to the shutter operating arm *E–3–d* and

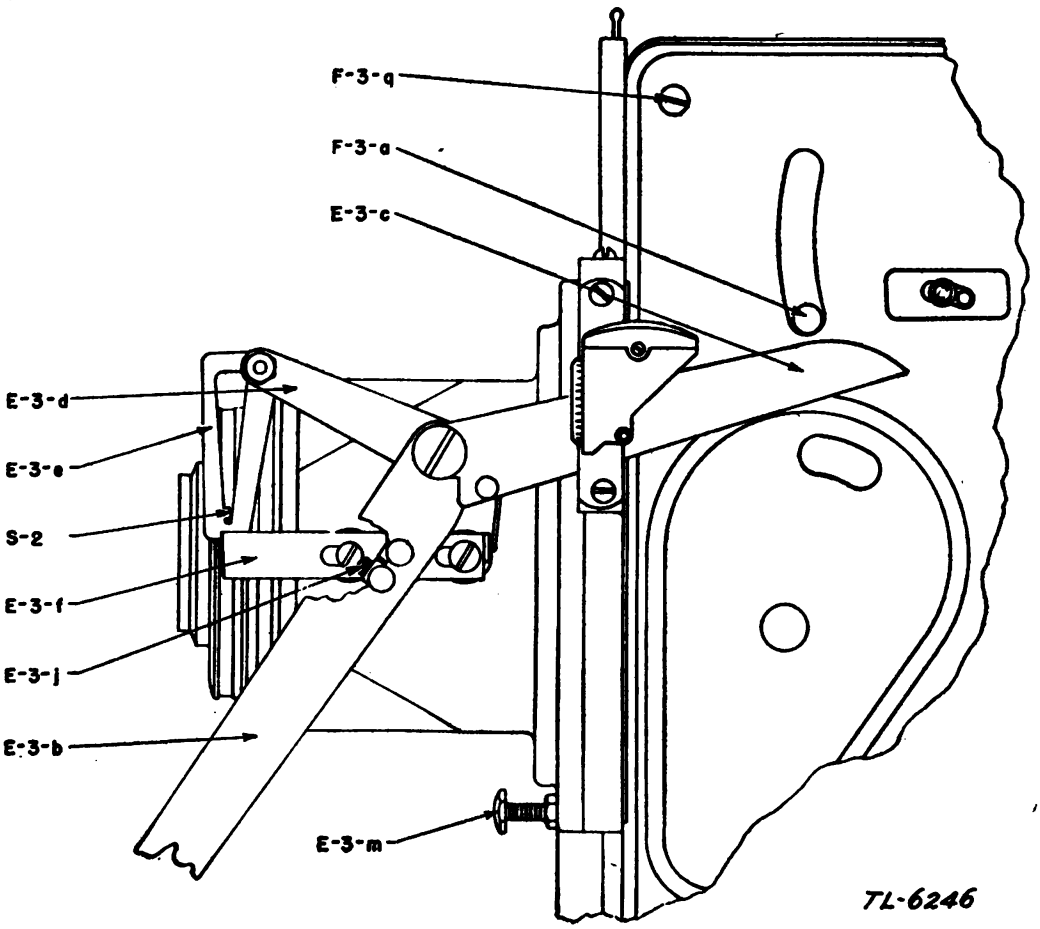


FIGURE 15.—Operating levers, full operated position.

link *E–3–e*, and to the magazine operating arm *E–3–c*. Forward movement of the operating arm *E–3–a* causes the operation and locking of the shutter, and its return movement relieves the shutter and advances the film. Each push-pull-push cycle begins and ends at the midpoint of the forward stroke just as the link *E–3–e* begins to pull up the shutter operating lever *S–2*.

**35. Shutter operating system.**—This system consists essentially of a device to move the shutter operating lever *S–2* which causes the shutter to function, and a lock to prevent its functioning again until



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fresh film has been placed behind the picture aperture. The shutter operating arm *E–3–d* is attached firmly to the main operating lever *E–3–b* and moves in unison with it. Forward movements of the main operating arm *E–3–a* cause the shutter operating link *E–3–e* to lift the shutter operating lever *S–2*. As *S–2* approaches the top of its rise it passes the end of the spring-loaded shutter lock slide *E–3–f*, allowing the slide to move out and preventing the premature return of *S–2*. Just before *S–2* reaches the top of its rise the shutter functions, as revealed by a distinct "click." Backward movement of the operating arm *E–3–a* lowers the link *E–3–e*, and, at the end of the stroke, withdraws the shutter lock slide *E–3–f*, thus permitting the shutter operating lever *S–2* to return to its rest position. The adjustable screws *E–3–j* and *E–3–k* (fig. 16) on the main operating lever *E–3–b* serve, respectively, to limit the upward travel of the shutter link *E–3–e* and to control the backward (releasing) movement of the shutter lock slide *E–3–f*.

**36. Magazine operating system** (figs. 7, 12, 14, and 16).—*a.* This system contains more moving parts than the others, and is best studied with the magazine attached to the camera. The mechanism cover *F–3* should first be removed after unscrewing the two mechanism cover screws *F–3–q;* then the magazine cover *F–2* should be removed and the magazine attached in the normal way. In this manner the operation of all moving parts may be observed clearly.

*b.* Backward movement of the operating arm *E–3–a* causes the magazine operating arm *E–3–c* to raise the magazine operating stud *F–3–a;* this in turn raises the magazine operating lever *F–3–b* and pulls the drive chain *F–3–c* to rotate the drive sprocket *F–3–f*. Rotation of the sprocket *F–3–f* causes its clutch mechanism to engage and rotate the drive pulley *F–3–i*, the take-up drive spring *F–3–j*, the take-up pulley *F–3–k*, and the take-up spool shaft *F–1–m*.

*c.* Associated with the main operating elements is the brake mechanism which checks any possible tendency of the drive mechanism to overrun. The drive-brake rod *F–3–n* passes through the brake operating pin *F–3–m* on the clevis of the drive-chain rod *F–3–e*. At the top of its rise the operating lever *F–3–b* causes two nuts on the brake rod *F–3–n* to engage the brake operating pin *F–3–m*, pulling the brake rod up and causing the brake arm *F–3–p* to engage one of four studs on the outside surface of the drive ratchet *F–3–g*. Similarly, there is a braking mechanism in the film chamber of the magazine, operated by the pull of the film on the floating idler *F–1–f*, which acts on the flange of the feed spool to check overrun at the end of the film advance.

*d.* The film advance control *F–3–r* is not required in this operation of the camera and magazine, and is rendered inoperative by the lock



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screw in the slot in the mechanism cover through which it protrudes. This arm is used to limit the film advance to one-half frame for certain purposes. The only attention required for the arm is to be sure that it is in the proper position to permit replacement of the mechanism cover *F–3*.

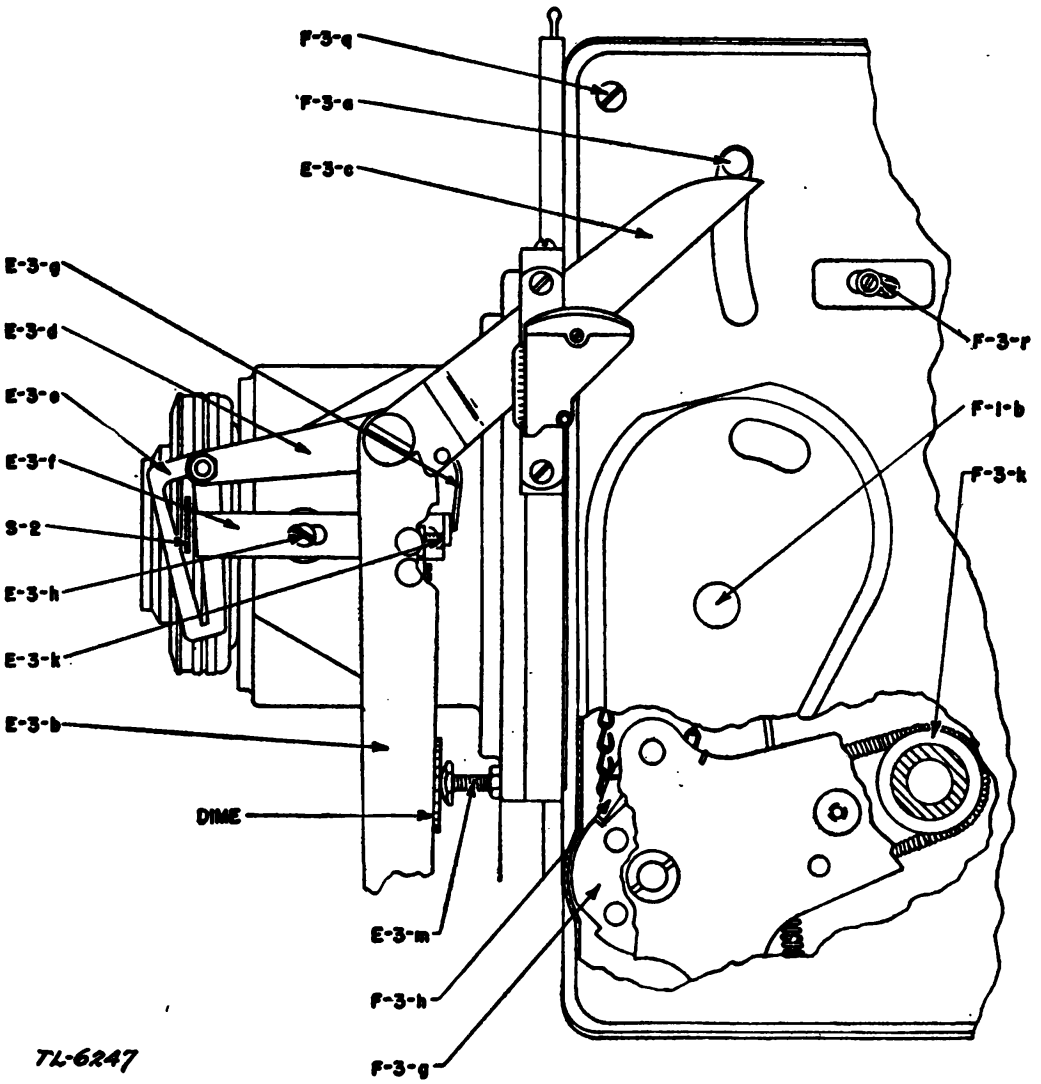


FIGURE 16.—Operating levers, normal position.

## SECTION IV

## MAINTENANCE


| | Paragraph |
|---|---|
| General | 37 |
| Adjusting magazine | 38 |
| Adjusting camera | 39 |


**37. General.**—The only parts of identification equipment PH–385 which need repair and which can be repaired in the field are the



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camera operating mechanism *E–3* and the magazine operating mechanism *F–3*. Since these two mechanisms operate together and each magazine is matched to its camera, it is necessary that the camera mechanism be adjusted while the magazine is attached to the camera.

**38. Adjusting magazine.**—*a.* Remove the magazine from the camera.

*b.* Unscrew the two mechanism cover screws *F–3–q* and remove the cover.

*c.* With the film advance control *F–3–r* in the position shown in figure 12, move the operating stud up and down several times by hand. When the stud is moved slowly toward its upper (forward) stop it should engage the drive ratchet *F–3–g* while the arm *F–3–a* is still 1/64 to 1/32 inch from the stop. If it does not engage properly, remove the cotter pin in the drive-brake operating pin *F–3–m*, lift out of the clevis the pin through which the brake rod *F–3–n* passes, and make the necessary adjustment of the position of the clevis on its threaded rod.

***Caution:*** Do not let the drive chain *F–3–c* disengage from the teeth on the sprocket *F–3–f* during the operation. Replace the pin *F–3–m* and its cotter pin.

*d.* Move the operating arm *F–3–a* against its forward stop; then let it return slowly to the rear stop. With the left thumb press the drive ratchet *F–3–g* against the pawl *F–3–h*. It should then be possible, with the right hand, to move the arm *F–3–a* away from the rear stop at least 1/64 inch. If this cannot be done, decrease the spacing of 1/64 to 1/32 inch just obtained, as described in *c* above.

*e.* With *F–3–a* against its forward stop, pull the brake rod *F–3–n* out from the pin *F–3–m* with the fingers. There should be a gap of 1/8 to 1/32 inch between the lock nuts and the pin. If not, adjust the nuts on *F–3–n* until this gap exists.

*f.* Replace the magazine on the camera in its operating position with the mechanism cover *F–3* still removed.

**39. Adjusting camera.**—*a.* With the film advance control *F–3–r* in the position shown in figure 7, move the main operating arm *E–3–a* back and forth through several complete operating cycles.

*b.* With the operating lever *E–3–a* at the point farthest back, release the arm. It should move freely forward until the magazine operating lever *F–3–b* comes to rest against its rear stop. If the arm does not move freely, examine *E–3–a*, *E–3–b*, and *E–3–c* (fig. 7) for bent parts and straighten them so that the arm will move freely to the position described.

*c.* Move the main operating arm *E–3–a* slowly forward until the shutter operating lever *S–2* is lifted far enough to permit the shutter



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lock slide *E–3–f* to snap forward beneath the shutter lever *S–2*. The shutter lock slide *E–3–f* should snap forward before the shutter operates.

*d.* After the shutter lock slide engages, a further forward movement of the operating arm of less than ⅛ inch should be sufficient to operate the shutter. If this operation and the engagement of the shutter lock slide do not take place in the proper manner and order, remove and examine the assembly of *E–3–b* and *E–3–d* for damage. Both of these arms should be rigidly attached to the collar *E–3–o* joining them. If any looseness has developed, the assembly should be replaced. If the assembly is in good condition, examine the shutter lock slide *E–3–f* for damage. If it has been bent, it should be straightened and adjusted to work properly.

*e.* At the most advanced position of the main operating arm *E–3–a*, it should be possible to move the shutter lever *S–2* farther with the finger. The purpose of this is to make sure that the shutter lever will not be strained by excessive movement of the main operating arm. If no further motion of the trigger is possible, it will be necessary to adjust the lower setscrew *E–3–j* (fig. 15) located inside of the operating lever *E–3–b* on the side toward the camera. This is done by screwing the setscrew into its sleeve until further motion of the trigger is available. After this adjustment has been made, check the operation of the parts as the operating arm *E–3–a* is brought forward to make sure that the sequence of operations as described above has not been disrupted.

*f.* As the operating arm *E–3–a* is pulled slowly backward, the pawl *F–3–h* should engage the sprocket *F–3–g* at a point 1/16 to 1/64 inch before the shutter lock slide *E–3–f* releases. If it does not so engage, adjust the release position of the shutter lock slide by means of the upper setscrew *E–3–k* under the operating lever *E–3–b*.

*g.* When the arm *F–3–b* rests against its forward stop, the magazine operating arm *E–3–c* must extend at least 3/16 inch beyond its point of contact with stud *F–3–a*. If it does not extend at least 3/16 inch at this point, it is evident that the stud *F–3–a*, or the lever *F–3–b* to which it is attached, has been bent. The damage may be repaired by forcing the stud *F–3–a* downward toward the bottom of the case, thus twisting the magazine operating lever *F–3–b*. This method of repair, however, may necessitate the readjustment of several parts on the camera (not on the magazine) which have already been adjusted.

*h.* When the conditions referred to in *g* above are met, a gap of from 1/64 to 1/32 inch (about the thickness of a dime) must remain between the lever *E–3–b* and its stop *E–3–m* (figs. 15 and 16). If there is not such a gap, the stop should be adjusted to that spacing.



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*i.* If all of the adjustments have been properly made according to the preceding specifications, it is necessary only to remove the magazine from the camera and to replace and screw down the cover, to complete the repair of the magazine and camera.

## SECTION V

## SUPPLEMENTARY DATA


| | Paragraph |
|---|---|
| List of replaceable parts | 40 |
| Index numbers used in illustrations | 41 |


### 40. List of replaceable parts.

| Reference No. | Description | Manufacturer's part No. |
|---|---|---|
| | **ASSEMBLIES** | |
| | Screw assembly, camera support | 26091 |
| | Handle | 20863 |
| | Screw | 26090 |
| | Identification equipment, complete | 27904 |
| | Stand, complete | 14337 |
| | Screw assembly | 26091 |
| | Magazine, complete | 26144 |
| | Lighting equipment, complete | 27854 |
| | Field stand, complete | 27898 |
| | Case, camera | 27899 |
| | Camera, complete | 27908 |
| E–4 | View finder assembly | 27906 |
| | Screw | 5323 |
| | View finder | 27901 |
| | Bracket | 27902 |
| | Camera, complete | 27908 |
| | Screw, stop | 21249 |
| | Screw, bracket | 25124 |
| | Washer, bracket | 26868 |
| | Camera assembly | 26110 |
| | Screw, cam guide | 27905 |
| | View finder assembly | 27906 |
| | Guide cam | 27907 |
| | **COMPACT STAND** | |
| | Top assembly | 9048 |
| | Panel | 4813 |
| | Tongues | 8321 |
| | Hinge assembly | 13667 |
| | Sections | 8322 |
| | Pin | 8323 |



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| Reference No. | Description | Manufacturer's part No. |
|---|---|---|
| | COMPACT STAND—Continued | |
| | Top, complete | 13675 |
| | Pins, name plate | 126 |
| | Screws, hinge assembly | 3517 |
| | Screw, camera clamp | 4738 |
| | Felt | 4841 |
| | Plate, clamp screw retaining | 6382 |
| | Screws, clamp, retaining plate | 8007 |
| | Washers, tilting clamp rod, loose | 8327 |
| D–2–g | Nut, tilting clamp rod | 8328 |
| | Top assembly | 9048 |
| | Screws, tilting arm | 12949 |
| | Screws, top casting | 12949 |
| | Hinge assembly | 13667 |
| | Tilting clamp rod assembly | 13679 |
| D–2–a | Casting, top | 14327 |
| D–2–b | Clamp screw assembly | 14335 |
| | Plate, name | 14341 |
| | Arm, right, tilting (perforated) | 16051 |
| | Arm, left, tilting | 22849 |
| | Top base assembly | 13677 |
| | Panel | 8320 |
| | Tongue, narrow | 8321 |
| | Tongue, wide | 14369 |
| | Tilting clamp rod assembly | 13679 |
| | Head | 4824 |
| | Rod | 8326 |
| | Leg clamp assembly | 14333 |
| | Clamp | 14311 |
| | Nut, clamp screw | 14312 |
| | Leg, clamp screw assembly | 14372 |
| | Screw assembly, center and lower casting clamp | 14334 |
| | Screw, post casting clamp | 17069 |
| | Web, post casting clamp screw | 14318 |
| D–2–b | Screw assembly, top casting | 14335 |
| | Web | 14319 |
| | Screw | 14321 |
| | Leg assembly | 14336 |
| | Block | 14308 |
| | Sides | 14309 |
| | Stand, complete | 14337 |
| | Screws, upper leg casting | 9306 |
| D–2 | Top, complete | 13675 |
| D–1–e | Post | 14307 |
| | Screws, leg braces to casting | 14315 |
| D–2–g | Casting, lower | 14316 |



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| Reference No. | Description | Manufacturer's part No. |
|---|---|---|
| | COMPACT STAND—Continued | |
| | Stand, complete—Continued. | |
| D–1–c | Casting, center | 14320 |
| | Screw, post stop | 14323 |
| | Nut, post stop screw | 14324 |
| D–1–d, D–1–h | Screw assembly, center and lower casting clamp | 14334 |
| | Washer, top casting leg | 14387 |
| D–1–a | Leg, complete | 15927 |
| | Clamp assembly, leg brace | 14339 |
| | Clamp | 8324 |
| D–1–f | Brace | 14313 |
| | Rivet, brace to clamp | 14314 |
| | Foot assembly | 14365 |
| | Foot | 14310 |
| | Strip, foot guide | 14325 |
| D–1–b | Screw assembly, leg clamp | 14372 |
| | Web | 14319 |
| | Screw | 14370 |
| | Leg complete | 15927 |
| | Screws, leg clamp plate | 669 |
| | Rivet, leg brace clamp and leg clamp to leg | 6624 |
| | Plate, leg clamp | 14322 |
| | Clamp, assembly, leg | 14333 |
| | Leg assembly | 14336 |
| | Clamp assembly, leg brace | 14339 |
| | Foot assembly | 14365 |
| | IDENTIFICATION UNIT CAMERA | |
| | Cam assembly | 26065 |
| | Pin | 21212 |
| | Cam | 26001 |
| | Screw assembly, camera support | 26091 |
| | Handle | 20863 |
| | Screw | 26090 |
| E–1 | Base assembly, camera | 26092 |
| | Base | 26024 |
| | Pin | 26030 |
| | Camera and back assembly | 26093 |
| | Screw, back to camera | 12953 |
| E–2 | Camera | 26028 |
| | Back | 26036 |
| E–3–a | Lever assembly, horizontal operating | 26101 |
| | Lever | 26102 |
| | Knob | 25793 |
| | Washer | 20423 |



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| Reference No. | Description | Manufacturer's part No. |
|---|---|---|
| | IDENTIFICATION UNIT CAMERA—Con. | |
| | Lever assembly, vertical operating | 26104 |
| E–3–b | Lever | 26002 |
| | Stud | 26105 |
| | Block, adjustment screw | 26106 |
| | Lever assembly, shutter operating and vertical operating | 26107 |
| | Lever assembly, vertical operating | 26104 |
| | Hub assembly | 26320 |
| E | Camera assembly | 26110 |
| | Pin, slide lock centering | 166 |
| | Screw, plate holder strip | 16693 |
| | Screw, shutter lock slide spring | 20608 |
| | Velvet, back frame | 20974 |
| E–2–c | Strip, plate holder | 20980 |
| E–2–b | Slide lock, plate holder | 20981 |
| | Screw, slide lock | 20987 |
| | Screw, cam guide | 22959 |
| E–3–f | Slide, shutter lock | 26003 |
| E–3–e | Link, shutter | 26004 |
| E–3–c | Cam assembly | 26065 |
| | Camera and back assembly | 26093 |
| | Pin, shutter operating lever stud | 26474 |
| | Washer, shutter operating lever stud pin | 26323 |
| | Nut, shutter operating lever stud pin | 26324 |
| | Lever assembly, horizontal operating | 26101 |
| | Lever assembly, shutter operating and vertical operating. | 26107 |
| E–3–g | Spring, shutter lock slide | 26111 |
| | Screw, shutter lock slide | 26112 |
| | Washer, shoulder shutter lock slide | 26100 |
| E–3–h | Stud, shutter lock slide | 26113 |
| | Stud, shutter operating lever | 26325 |
| E–3–n | Screw, shutter operating lever stud | 26115 |
| | Washer, shutter lock slide | 26116 |
| E–3–m | Screw, vertical operating lever stop | 26117 |
| | Nut, vertical operating lever stop screw | 26118 |
| E–3–k | Nut, shutter link screw | 26118 |
| E–3–j, E–3–k | Screw, vertical operating lever adjusting | 26119 |
| | Screw, vertical operating lever | 26121 |
| | Screw, shutter link | 26122 |
| | Spacer, cam guide lower | 26152 |
| | Spacer, cam guide upper | 26153 |
| | Guide, cam | 26154 |



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| Reference No. | Description | Manufacturer's part No. |
|---|---|---|
| | **IDENTIFICATION UNIT CAMERA—Con.** | |
| | Camera assembly—Continued. | |
| E–5 | Panel, complete, focusing | 26167 |
| | Washer, shutter operating lever lock | 26169 |
| | Shim, shutter | 26178 |
| | Shim, shutter | 26179 |
| | Shim, shutter | 26180 |
| E–2–a | Screw assembly, camera support | 26091 |
| | Base assembly, camera | 26092 |
| | Washer, camera support screw | 26124 |
| | Lens | 26125 |
| | Panel assembly, focusing | 26163 |
| | Stile | 26164 |
| | Rail, top | 26165 |
| | Rail, bottom | 26166 |
| | Panel complete, focusing | 26167 |
| | Screw, glass retainer | 3158 |
| | Glass, ground | 21067 |
| | Retainer | 21068 |
| | Panel and plate assembly, focusing | 26172 |
| | Panel and plate assembly, focusing | 26172 |
| | Screw | 669 |
| | Plate | 20957 |
| | Panel assembly, focusing | 26163 |
| | Hub assembly, shutter operating | 26320 |
| E–3–d | Lever, shutter operating | 26108 |
| E–3–o | Hub | 26109 |
| | **IDENTIFICATION UNIT MAGAZINE** | |
| | Plate assembly, film pressure | 21346 |
| | Rivet, plate | 26008 |
| F–1–h | Plate | 21022 |
| | Hinge | 21023 |
| | Rivet, hinge | 21024 |
| | Arm | 21025 |
| | Spacer, arm | 21027 |
| | Stop assembly, single frame | 21348 |
| F–3–n | Stop | 21029 |
| | Pin, stop | 21111 |
| | Cutoff assembly, light | 21351 |
| | Strip | 21148 |
| | Cutoff | 21149 |
| | Covering | 21150 |
| F–1–d | Slide assembly | 21352 |
| | Slide | 21146 |
| | Handle | 21147 |



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| Reference No. | Description | Manufacturer's part No. |
|---|---|---|
| | IDENTIFICATION UNIT MAGAZINE—Con. | |
| | Wheel assembly, ratchet | 21356 |
| F–3–g | Wheel | 21128 |
| | Stud, drive pawl | 21131 |
| F–3–h | Pawl | 21132 |
| | Spring | 21133 |
| | Pin, pawl stop | 21212 |
| | Sprocket assembly, chain | 21357 |
| | Bushing | 21129 |
| F–3–f | Sprocket | 21130 |
| | Shaft assembly, film sprocket (shown on No. 21523) | 21358 |
| | Shaft | 21100 |
| F–3–i | Pulley, drive | 21127 |
| | Pin, taper, drive pulley | 21198 |
| | Wheel assembly, ratchet | 21356 |
| | Sprocket assembly, chain | 21357 |
| | Chain and clevis assembly | 21360 |
| F–3–c | Chain | 21116 |
| | Clevis | 21117 |
| F–3–e | Rod, clevis screw | 21119 |
| | Pin, clevis screw rod cotter | 21194 |
| | Nut, clevis screw rod lock | 21196–E |
| | Cover, complete, magazine | 21362 |
| | Cover | 21077 |
| | Nut, magazine cover | 21079 |
| | Washer, magazine cover nut | 21080 |
| | Washer, magazine cover nut lock | 21081 |
| | Wheel assembly, counter ratchet | 21363 |
| | Pinion | 21155 |
| | Wheel | 21156 |
| | Eccentric assembly, counter | 21365 |
| | Eccentric | 21162 |
| | Pin | 21164 |
| | Cover assembly, counter | 26161 |
| | Cover | 26073 |
| | Bushing, counter ratchet wheel | 21157 |
| | Counter assembly | 26160 |
| | Pin, counter knob | 120 |
| | Stud, counter gear | 21152 |
| | Spacer, counter gear | 21153 |
| | Gear | 21154 |
| F–1–b | Knob, counter setting | 21158 |
| | Pawl | 21159 |
| | Spring pawl | 21161 |
| | Stud, counter eccentric | 21163 |
| | Bushing, counter pawl | 21165 |
| | Wheel assembly, counter ratchet | 21363 |



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| Reference No. | Description | Manufacturer's part No. |
|---|---|---|
| | **IDENTIFICATION UNIT MAGAZINE—Con.** | |
| | Counter assembly—Continued. | |
| | Eccentric assembly, counter | 21365 |
| | Cover assembly, counter | 26161 |
| | Lever assembly, chain | 22260 |
| F–3–b | Lever | 21036 |
| F–3–a | Stud | 22252 |
| | Arm assembly, brake (supply spool) | 22301 |
| | Rivet | 19646 |
| | Arm | 21084 |
| | Brake | 21091 |
| | Stud, brake spring arm | 21092 |
| | Idler assembly | 22302 |
| | Retainer | 22305 |
| | Spacer | 22306 |
| | Stud, brake arm idler | 22308 |
| | Idler assembly | 22302 |
| | Bushing | 22303 |
| F–1–f | Idler | 22304 |
| | Roller assembly, sprocket | 22316 |
| | Spacer | 22309 |
| | Arm | 22312 |
| | Stud | 22313 |
| | Roller | 22314 |
| | Pawl assembly, stop | 26138 |
| | Stud, pull rod | 21209 |
| | Pawl | 21211 |
| | Spring | 26162 |
| F–3–n | Rod pull | 26087 |
| | Spacer, stud | 26129 |
| | Plate assembly bearing | 26139 |
| | Stud | 21039 |
| | Plate | 21070 |
| | Bushing, mechanism cover screw | 21122 |
| | Bearing, film sprocket shaft | 21125 |
| | Bearing, take-up shaft | 21126 |
| | Spacer, back pawl | 21134 |
| | Stud, back pawl | 21135 |
| | Pin, pawl stop | 21212 |
| | Pawl, back | 26146 |
| | Spring, pawl back | 21214 |
| | Pawl assembly, stop | 26138 |
| | Cover assembly, mechanism | 26140 |
| | Screw, counter cover | 19429 |
| | Rivet, name plate | 126 |
| | Counter assembly | 26160 |
| | Reinforcement, counter cover | 22850 |



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| Reference No. | Description | Manufacturer's part No. |
|---|---|---|
| | **IDENTIFICATION UNIT MAGAZINE—Con.** | |
| | Cover assembly, mechanism—Continued. | |
| | Plate, name | 26005 |
| | Cover | 26083 |
| | Washer, lever stop | 15851 |
| | Nut, lever stop | 20289 |
| | Screw, lever stop | 16694 |
| | Case assembly, magazine | 26141 |
| | Screw | 16693 |
| | Top plate, camera adapter | 21138 |
| | Rivet, aperture plate | 21201 |
| | Rivet, camera adapter, short | 21203 |
| F-1-g | Pin, film guide | 21207 |
| | Pin, film guard | 21208 |
| | Case | 26128 |
| | Plate, film aperture | 26130 |
| | Case, complete, magazine | 26142 |
| | Pivot, pressure plate | 21028 |
| F-1-e | Stud and feed spool | 21030 |
| | Spacer, feed spool stud | 21031 |
| | Sleeve, feed spool stud | 21032 |
| | Pivot, chain lever | 21037 |
| | Stud, magazine cover | 21082 |
| | Pin, brake arm stop | 21090 |
| | Stud, brake spring case | 21093 |
| | Stud, pressure plate spring | 21094 |
| | Stud, fixed film idler | 21098 |
| | Post, chain spring | 21114 |
| | Plate, camera adapter, second | 21139 |
| | Plate, camera adapter, third | 21140 |
| | Plate, large bottom (thick) | 21141 |
| | Plate, camera adapter, fourth | 21142 |
| | Plate, small bottom | 21143 |
| | Plate, large bottom (thin) | 21160 |
| | Pin, stop pawl spring | 21167 |
| | Rivet, camera adapter (long) | 21202 |
| | Rivet, camera adapter (short) | 21203 |
| | Cutoff assembly, light | 21351 |
| | Pivot, single frame stop | 26132 |
| | Case assembly, magazine | 26141 |
| | Magazine assembly | 26143 |
| | Pin, sprocket | 124 |
| | Screw, bearing plate stud | 19622 |
| | Screw, pressure plate pivot | 19622 |
| | Screw, fixed film idler | 19622 |
| | Screw, chain lever pivot | 19622 |
| | Nut, pull rod | 20289 |



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| Reference No. | Description | Manufacturer's part No. |
|---|---|---|
| | **IDENTIFICATION UNIT MAGAZINE—Con.** | |
| | Magazine assembly—Continued. | |
| | Washer, pressure plate | 21026 |
| | Washer, chain lever | 21038 |
| F–1–j | Sprocket, film | 21074 |
| | Stud, brake arm | 21083 |
| F–3–o | Spring, brake | 21089 |
| | Spring, pressure plate | 21095 |
| F–1–m | Shaft, take-up | 21096 |
| | Guard, sprocket | 21097 |
| F–1–i | Idler, fixed film | 21099 |
| | Pin, sprocket shaft counter | 21108 |
| | Screw, single frame stop | 21110 |
| | Washer, single frame stop spring | 21112 |
| F–3–j | Belt, spring | 21113 |
| F–3–d | Spring, chain | 21115 |
| F–3–k | Pulley, take-up | 21121 |
| | Bearing, film sprocket case | 21123 |
| | Bearing, take-up shaft case | 21124 |
| | Screw, sprocket guard | 21189–A |
| | Pin, clevis pin cotter | 21195 |
| | Pin, take-up pulley taper | 21198 |
| | Plate assembly, film pressure | 21346 |
| | Stop assembly, single frame | 21348 |
| | Shaft assembly, film sprocket | 21358 |
| | Chain and clevis assembly | 21360 |
| | Lever assembly, chain | 22260 |
| | Arm assembly, brake | 22301 |
| | Screw, sprocket roller | 22310 |
| | Washer, sprocket roller | 22311 |
| | Spring, sprocket roller | 22315 |
| | Roller assembly, sprocket | 22316 |
| F–3–m | Pin, clevis | 26133 |
| | Plate assembly, bearing | 26139 |
| | Case, complete, magazine | 26142 |
| F | Magazine, complete | 26144 |
| | Spool, take-up | 21166 |
| F–3–q | Screw, mechanism cover | 27665 |
| | Slide assembly | 21352 |
| | Cover complete, magazine | 21362 |
| | Cover assembly, mechanism | 26140 |
| | Magazine assembly | 26143 |
| | Washer, lock mechanism cover lock | 27666 |



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| Reference No. | Description | Manufacturer's part No. |
|---|---|---|
| | STAND | |
| | Stand, complete (background support) | 27898 |
| | Washer | 20420 |
| G–1–g | Wedge, handle | 27860 |
| | Base assembly | 27865 |
| | Cross arm assembly | 27869 |
| | Cross arm support assembly | 27873 |
| | Arm assembly | 27876 |
| | Nut | 27881 |
| G–2–g | Spring, curtain | 27884 |
| | Leg, assembly, complete | 27890 |
| G–3 | Curtain, background | 27891 |
| H–3 | Board, title | 27895 |
| | Case, stand | 27897 |
| | Base assembly, title board | 27865 |
| | Screw, ears | 667 |
| G–1–f | Bolt | 16246 |
| H–1–f | Lug, chain | 27859 |
| H–1–c | Ear, assembly | 27861 |
| H–1–b | Standard | 27862 |
| | Support assembly | 27863 |
| H–1–d, G–2–d, G–1–d. | Nut | 27881 |
| | Screw, stop | 27883 |
| | Ear assembly, tripod leg | 27861 |
| | Pin | 6384 |
| | Ear | 27911 |
| G–2 | Crossarm assembly, background | 27869 |
| | Bolt | 16246 |
| | Washer | 20420 |
| G–2–c | Link, long | 27866 |
| G–2–a | Link, short | 27867 |
| G–2–b | Link, center | 27868 |
| | Nut | 27881 |
| G–2–f | Eyes, screw | 27882 |
| | Screw, stop | 27883 |
| H–2–f | Spreader | 6622 |
| G–1 | Background support assembly | 27873 |
| | Bolt | 16246 |
| | Washer | 20420 |
| G–1–a | Support, lower | 27870 |
| G–1–b | Support, center | 27871 |
| G–1–c | Support, upper | 27872 |
| | Nut | 27881 |
| | Screw, stop | 27883 |
| G–4 | Arm assembly | 27876 |
| | Hinge | 27874 |
| | Arm | 27875 |



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| Reference No. | Description | Manufacturer's part No. |
|---|---|---|
| | STAND—Continued | |
| | Arm assembly—Continued. | |
| | Pin, escutcheon | 27893 |
| | Washer | 27894 |
| H–2 | Leg assembly, complete | 27890 |
| | Nut, chain screw | 19648 |
| | Washer | 20423 |
| | Washer, chain screw | 21903 |
| | Screw, chain | 25178 |
| H–2–c | Support | 27857 |
| | Leg assembly | 27877 |
| H–2–a | Sliding leg (part of No. 27877) | |
| H–2–b | Folding leg (part of No. 27877) | |
| | Bolt | 27878 |
| | Nut | 27880 |
| H–2–e | Chain | 27887 |
| H–1–a | Support assembly, tripod leg (titleboard support) | 27863 |
| | Block | 27864 |
| | Nails | 27885 |
| | Support | 27910 |
| | LIGHTING EQUIPMENT | |
| C–3–a | Clamp assembly, right | 20868 |
| | Clamp | 20852 |
| | Screw | 20857 |
| | Washer | 20873 |
| | Nut assembly | 20874 |
| C–1–a | Screw assembly, cross arm bracket | 20870 |
| | Screw | 20862 |
| | Handle | 20863 |
| | Cross arm assembly | 20871 |
| | Rivet | 6624 |
| C–1 | Bracket | 20850 |
| C–1–b | Arm | 20854 |
| | Nut assembly, clamp tightening | 20874 |
| | Nut | 20858 |
| | Handle | 20863 |
| | Screw assembly, square clamp tightening | 21597 |
| | Handle | 20863 |
| | Screw | 21596 |
| | Lighting equipment, complete | 27854 |
| C–5–b | Lamp, 150-watt | 20898 |
| | Connector tap | 20899 |
| C–2–a | Clamp, clearance section | 21591 |
| C–2–a | Clamp, threaded section | 21592 |
| | Washer, clamp screw | 21598 |



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| Reference No. | Description | Manufacturer's part No. |
|---|---|---|
| | LIGHTING EQUIPMENT—Continued | |
| | Lighting equipment—Continued. | |
| | Clamp assembly | 20868 |
| | Screw assembly, cross arm bracket | 20870 |
| | Cross arm assembly | 20871 |
| | Screw assembly, square clamp tightening | 21597 |
| C–5–a | Lamp, 300-watt | 26064 |
| C–3, C–2 | Arm, extension | 27851 |
| | Cord set | 27852 |
| | Fixture, lighting | 27853 |

Equipment manufacturer..... Folmer Graflex Corporation, Rochester, N. Y.

## 41. Index numbers used in illustrations.

*A—Case A*

A–1 lock
A–2 clamps
A–3 carrying handle
A–4 end handle
A–5 false bottom

*B—Case B*

B–1 lock
B–2 clamps
B–3 carrying handle
B–4 end handle, right
  B–4–a end handle, upper left
  B–4–b end handle, lower left

*C—Lighting System*

C–1 lighting-support bracket
  C–1–a key screw
  C–1–b center tube (black)
C–2 horizontal tube (black)
  C–2–a fixed tube clamps (2)
C–3 vertical tube (black)
  C–3–a adjustable tube clamp (1)
C–4 extension arm (2, cadmium-plated)
  C–4–a tube
  C–4–b adjustable clamp
  C–4–c lamp sockets (2)
C–4 extension arm—Continued.
  C–4–d lamp cords (2)
C–5 lamps
  C–5–a lamp, 300-watt, 110-volt
  C–5–b lamp, 150-watt, 110-volt
C–6 multiple plug
C–7 supply cord

*D—Tripod*

D–1 tripod, complete
  D–1–a legs (3)
  D–1–b leg wing screw
  D–1–c leg ring
  D–1–d leg ring wing screw
  D–1–e column
  D–1–f leg brace
  D–1–g leg brace ring
  D–1–h leg brace wing screw
D–2 tilting tripod top
  D–2–a collar
  D–2–b collar wing screw
  D–2–c base
  D–2–d platform
  D–2–e tilting arm, right (notched)
  D–2–f tilting arm, left
  D–2–g thumb nut



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D–2 tilting tripod top—Con.
D–2–h camera clamp screw

*E—Camera*

E–1 pedestal
E–2 body
E–2–a camera key screw
E–2–b slide lock
E–2–c retaining strip
E–3 operating-lever system
E–3–a main operating arm
E–3–b main operating lever
E–3–c magazine operating arm
E–3–d shutter operating arm
E–3–e shutter operating link
E–3–f shutter lock slide
E–3–g shutter lock slide spring
E–3–h shutter lock slide guide stud
E–3–i shutter lock slide guide screw
E–3–j link stroke limiting screw
E–3–k film advance limiting screw
E–3–m operating lever stroke adjusting screw
E–3–n lever-pivot screw
E–3–o lever-pivot collar
E–4 view finder
E–5 ground glass focusing panel

*F—Film magazine*

F–1 body
F–1–a exposure counter dial
F–1–b counter setting knob
F–1–c picture aperture
F–1–d slide
F–1–e supply spool shaft
F–1–f floating idler
F–1–g guide stud
F–1–h pressure plate
F–1–i stationary idler
F–1–j drive sprocket
F–1–k pressure idler
F–1–m take-up spool shaft
F–2 cover
F–2–a cover knob
F–3 mechanism cover
F–3–a operating stud
F–3–b magazine operating lever
F–3–c drive chain
F–3–d drive-chain spring
F–3–e drive-chain clevis-and-rod spring
F–3–f drive sprocket
F–3–g drive ratchet
F–3–h drive pawl
F–3–i drive pulley
F–3–j take-up drive spring
F–3–k take-up pulley
F–3–m drive-brake operating pin
F–3–n drive-brake rod
F–3–o drive-brake spring
F–3–p drive-brake arm
F–3–q mechanism cover screw
F–3–r film advance control

*G—Background equipment*

G–1 background support
G–1–a lower section
G–1–b center section
G–1–c upper section
G–1–d wing nuts (3)
G–1–e bolts, short (2)
G–1–f bolt, long (1)
G–1–g support wedges
G–2 cross arm
G–2–a left section (long)
G–2–b center section
G–2–c right section (short)
G–2–d wing nuts
G–2–e bolts
G–2–f screw eyes
G–2–g curtain spring
G–3 background curtain
G–4 curtain weight



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*H—Titling equipment*

H–1 base
- H–1–a front section
- H–1–b rear section
- H–1–c ears
- H–1–d wing nut
- H–1–e bolt
- H–1–f chain lug

H–2 titleboard holder
- H–2–a sliding leg
- H–2–b folding legs (2)
- H–2–c crosspiece
- H–2–d crosspiece wing nut
- H–2–e chain
- H–2–f spreader
- H–2–g sliding leg thumbscrew

H–3 title board (6)
H–4 letter box (3)

*J—Fingerprinting equipment*

J–1 card holder
J–2 inking slab
J–3 ink bottles (2)
- J–3–a inking wad

*L—Lens*

L–1 front cell
- L–1–a focusing lock screw

L–2 diaphragm lever

*S—Shutter*

S–1 shutter speed lever
S–2 shutter operating lever

[A. G. 062.11 (4–5–43).]

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(For explanation of symbols see FM 21–6.)



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